Economics Background Document

Estimate of National Economic Impact for Conditional Exclusion of Solvent Industrial Wipes from RCRA Hazardous Waste Regulation

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17 July 2003

Preface

This document was prepared by Mark Eads, Economist, of the USEPA Office of Solid Waste (OSW) Economics, Methods, and Risk Analysis Division (EMRAD), based in part, on a 20 August 2000 initial economic study prepared by Northbridge Environmental Management Consultants (319 Littleton Road, Suite 208, Westford, MA 01886, (978) 392-9665), as sub-contractors to Science Applications International Corporation, under USEPA Contract 68-W98-025, Work Assignment 2-5. Jim O'Leary, Program Analyst in OSW's Hazardous Waste Identification Division, was work assignment manager for the initial economic study.

Stephanie Carroll, a chemical engineering undergraduate student from the University of Arizona, and 2001 summer intern with EMRAD, provided research assistance for the industrial wipes price elasticity meta-analysis, which is applied in this document for simulation of potential impacts of the proposed RCRA exclusions, on the US national market for industrial wipes.

The USEPA's Office of Water previously evaluated some aspects of the use and handling of industrial wipes in the US economy, with a focus on evaluating pollutants contained in wastewater discharges from industrial laundries. The Office of Water conducted its evaluation under different regulatory authority than the proposed RCRA regulatory exclusions evaluated in this Economics Background Document. Information about the Office of Water's prior regulatory investigation of industrial laundries is provided at the USEPA website http://www.epa.gov/ost/guide/laundry, and at Industrial Safety and Hygiene News ("Industrial Shop Towels: Pollutant or Solid Waste?", Aug 1998, p.27, http://www.ishn.com/ishn/cda/articleinformation/features/bnp__features__item/0,2162,2602,00.html). Some information about industrial laundries in this document is borrowed from the USEPA's March 2000 economic report in support of the Office of Water's regulatory evaluation (http://www.epa.gov/waterscience/guide/laundry/final/economics.pdf).

The Office of Management & Budget (OMB) reviewed a draft of this background document during their 90-day review period completed on 23 July 2003, according to the procedures set-forth in White House Executive Order 12866 "Regulatory Planning & Review" (30 Sept 1993; http://www.whitehouse.gov/omb/inforeg/eo12866.pdf).

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I. Introduction to Economic Analysis

I.A. Overview of Proposed RCRA Exclusions

EPA's Office of Solid Waste is proposing a new Federal exclusion from RCRA regulations, which will potentially affect **industrial facilities** that generate and handle **solvent-contaminated** wipes, rags, and shop towels. These classes of products are collectively named "***industrial wipes***" in this study. The proposed exclusions will constitute a new subpart in Part 261 of Title 40 of the *Code of Federal Regulations* (CFR).[1] Under EPA's current RCRA hazardous waste regulations[2], industrial wipes contaminated with any of the following three classes of RCRA hazardous wastes, also become RCRA hazardous wastes:

- **!** RCRA-listed solvents: One or more of **37 different chemical solvents** listed under RCRA hazardous wastecodes F001-F005 (40 CFR 261.31),
- **!** RCRA-listed chemicals: Comparable P- and U-listed commercial chemical products that are spilled and cleaned up with industrial wipes, and
- **!** RCRA-characteristic solvents: Solvents exhibiting a hazardous characteristic (i.e. D001 ignitability, D002 corrosivity, D003 reactivity, or D004 to D043 toxicity leaching as defined at 40 CFR 261 Subpart C),

Solvent- or other RCRA-waste contaminated wipes would otherwise be managed according to the RCRA Subtitle C "cradle-to-grave" hazardous waste management requirements (40 CFR 260 to 270). However, current EPA Federal policy (as of 1991) is to defer the determination of the RCRA regulatory status of industrial wipes to EPA regional offices and to State governments.[3]

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[1] The United States "*Code of Federal Regulations*" (CFR) is published by the Office of the Federal Register, National Archives and Records Administration (NARA). The CFR is an annual codification of the general and permanent rules published daily in the *Federal Register* (FR) by the Executive departments and agencies of the Federal Government. The CFR is divided into 50 titles which represent broad topic areas subject to Federal regulation. Title 40 of the CFR is "*Protection of Environment*", and contains USEPA's regulations. The CFR is kept up-to-date by the individual daily issues of the *Federal Register*, and each volume of the CFR is updated annually. Full text of the CFR and the FR are available at NARA's website: http://www.nara.gov/fedreg or at the US Government Printing Office's website: http://www.access.gpo.gov/nara .

[2] The USEPA's "*RCRA Orientation Manual*" (report nr. EPA-530-R-98-004, May 1998, 290 pages), contains descriptive information about the USEPA's hazardous waste program and regulations, as authorized by Congress in Subtitle C of the 1976 Resource Conservation and Recovery Act (RCRA). Hardcopies of the Manual are available to the public by calling the National Service Center for Environmental Publications (8980-490-9198); an electronic copy is available at http://www.epa.gov/epaoswer/general/orientat/index.htm . Further information about RCRA, and about the the USEPA's Office of Solid Waste, is also available from the RCRA Public Information Center Hotline (800-424-9346 or via the Internet at http://www.epa.gov/epaoswer/hotline), and on USEPA's Office of Solid Waste website at http://www.epa.gov/osw .

[3] The current delegation of regulatory status from Federal RCRA to state governments for solvent-contaminated wipes, is based on the policy determinations described in a 23 Jan 1991 letter from the EPA's Office of Solid Waste former Director (Sylvia K. Lowrance), to Lance R. Miller, Director, New Jersey DEP Hazardous Waste Management Division, as well as in a 14 Feb 1994 memorandum from EPA's OSW Director (Michael Shapiro), to EPA's regional waste management directors. Prior to 1991, EPA received three petitions for excluding both disposable and reusable wipes from RCRA hazardous waste regulation (1985 Kimberly-Clark Corp; 1987 Scott Paper Co.; 1987 Alliance of Textile Care Associations). On 20 May 1992 (57 FR 21450, 21473-74), EPA proposed a rule which would exclude solvent-

The proposed new regulation would essentially codify current state government policies regarding[4]:

- **Disposable industrial wipes**: **Conditionally exclude** from 40 CFR 261.3 RCRA definition of **hazardous waste**; state governments now regulate disposable wipes contaminated with RCRA-listed and RCRA-characteristic (e.g. ignitable) hazardous waste spent solvents as hazardous waste,

- **Reusable industrial wipes**: **Conditionally exclude** from 40 CFR 261.4 RCRA definition of **solid waste**; state governments now conditionally-exclude solvent-contaminated reusable wipes from hazardous waste regulation, if the wipes contain no free liquids and will be sent to a commercial laundry for cleaning and reuse

provided that generators manage wipes in accordance with certain **exclusion conditions**. The proposed exclusions do not apply to industrial wipes contaminated with solvents that when spent are not hazardous wastes under RCRA regulations. The Federal Register announcement of the proposed RCRA exclusions provides a detailed description of the proposed conditions. To reduce reader burden, this "*Economics Background Document*" does not duplicate that description but provides a simplified summary of the conditions.

I.B. Scope of Economic Analysis

Element	Description of Scope Element
Affected Facilities:	Estimation of the number of respective wipes used and the number of solvent-contaminated industrial wipes "***generators***" (i.e., facilities which use wipes in conjunction with solvents, thereby generating solvent-contaminated wipes), and any other types of entities subject or potentially affected by the proposed exclusions;

contaminated industrial wipes from RCRA regulation based on visible contamination and ignitability, toxicity or reactivity exclusion criteria. EPA withdrew the proposed rule on 30 Oct 1992 (57 FR 49280).

[4] For example, (1) the State of Ohio issued Guidance No. DHWM-007 in 1994 "Solvent-Contaminated Rags And Wipers", which classified solvent-contaminated disposable industrial wipes as hazardous wastes, and solvent-contaminated reusable industrial wipes as conditionally-excluded from the definition of solid waste (http://www.epa.state.oh.us/dhwm/guidsolr.htm); (2) the State of Oregon Dept of Environmental Quality issued a "Hazardous Waste/Toxic Reduction Policy Clarification" on 03 May 1996 to the Uniform & Textile Service Assoc, stating "...this exemption applies only to rags or wipers which are laundered for reuse and meet the above conditions [no free liquids, closed transport containers with labels, and 3 other conditions]. If those rags or wipers are disposed, treated prior to disposal, or do not meet any of the above conditions, they weill be considered a solid waste and be subject to waste determination and applicable hazardous waste regulations." (http://www.deq.state.or.us/wmc/hw/policy/1996-LM-001.html).

Element	Description of Scope Element
Potential Economic Impacts:	Translate the conditions for the proposed exclusions into particular types of affected facility implementation activities, equipment or other incremental changes in business practices, which a typical facility is expected to require to become eligible for and maintain a regulatory exclusion, relative to the current "***baseline***" (i.e. relative to the current regulatory status of affected generators and other wipes handlers, and to their respective current solvent wipes use and spent wipes management practices):
	! Direct: Estimation of potential "***direct***" regulatory compliance impacts (i.e., economic costs and cost savings) for the: ! Proposed exclusions (main proposal); and ! Alternative regulatory options described in the Federal Register announcement.
	! Induced: This study also includes estimation of potential "***induced***" market effects on the relative price of reusable and disposable industrial wipes, and on their respective marketshare in the US national economy, for the main proposal (not the options). Direct impacts may translate into a change in the **relative unit cost** (i.e. life cycle unit cost) of the two types of industrial wipes (disposables and resusables), which may induce a marginal shift in respective national annual usage **marketshare**, depending upon the "*price-elasticity of substitution*" between disposable and reusable wipes (i.e., sensitivity of wipes users to changes in the relative life cycle unit cost of the two types of industrial wipes).
Small Business Impacts:	A relatively large proportion of the facilities in each of the potentially affected industries are small businesses. This study evaluates the net effect of both direct and induced impacts on each industry, and on small businesses in particular, for the main proposal (not the options).
Sensitivity Analysis:	For purpose of comparison to the "*most-likely*" key parameter settings applied as impact estimation factors, this document presents the impact estimation results according to alternative combinations of numerical values (i.e. **uncertainty ranges**) assigned to **15 key parameters**, to reflect information uncertainty. The sensitivity analysis includes three alternative cases (i.e. combination sets of numerical assumptions for key parameters), designed to produce an overall range in economic impact estimate from low to high, respectively: ! "*Lower-bound*": Lowest estimate of number of entities impacted, as well as minimum unit values & quantities. ! "*Most-likely*": "Best judgement" settings for key variables (which do not necessarily represent the mid-point between the lower- and upper-bound). ! "*Upper-bound*": Highest estimate of number of entities impacted, as well as maximum unit values & quantities.

Element	Description of Scope Element
Other proposed regulatory options	In addition to the proposed conditions for the exclusion, this document provides an estimate of the potential economic impacts associated with regulatory options described in the Federal Register announcement of the proposed rule. There are two main alternative regulatory options (approaches), as well as at least one alternative option for each of the major conditions for the proposed exclusion.

I.C. Economic Impact Elements of the Proposed Regulatory Exclusion

EPA's proposal would amend the hazardous waste management regulations under RCRA and formally codify a conditional exclusion from RCRA regulations for solvent-contaminated industrial wipes. The exclusion would be granted if users and handlers of solvent-contaminated industrial wipes maintain certain "***conditions***" as summarized in the following table.

In comparison to hypothetical full compliance with the existing RCRA Subtitle C hazardous waste regulations (40 CFR 260 to 299), EPA's proposed exclusions potentially offer annual net cost savings to solvent-contaminated wipes generators and spent wipes handlers. For example, sources of cost savings compared to full RCRA Subtitle C compliance are:

- **!** Spent wipes reporting: Avoidance of the costs for RCRA hazardous waste activity notification, waste management permitting, and waste transport manifesting paperwork requirements for generating and managing spent solvent industrial wipes, and

- **!** Spent wipes management: Lower costs associated with non-hazardous waste management alternatives, compared to managing solvent-contaminated spent industrial wipes at RCRA Subtitle C permitted hazardous waste management facilities.

However, there are potential **implementation costs** for complying with the conditions of the proposed regulatory exclusion, which are expected in part or in whole for some facilities, to offset the magnitude of savings compared to hypothetical full RCRA compliance costs. Because such implementation costs are relatively modest in magnitude, compared to the potential full-compliance cost savings, we assumed in this study that all eligible spent industrial wipes generators would take advantage of the proposed exclusions, and only considered a sensitivity analysis range in the percentage of states (i.e. 50%, 75%, or 100%) which may adopt the exclusions after USEPA promulgates them as a final rule.[5]

[5] Generators of solvent contaminated wipes will retain the option of managing their disposables in full compliance with RCRA Subtitle C hazardous waste management requirements (i.e. 40 CFR 260 to 270), in lieu of the proposed exclusions.

Summary of Proposed Conditions for RCRA Exclusions of Solvent-Contaminated Industrial Wipes			
		Conditions for RCRA Exclusions	
Item	Exclusion Condition	Disposable Wipes (exclusion from RCRA definition of hazardous waste)	Reusable Wipes (exclusion from RCRA definition of solid waste)
1	Applicable (potentially eligible) solvents	! Exclusion would <u>not</u> apply to: – 11 specific RCRA F-listed chemical solvents (any % blends involving these solvents) – wipes contaminated with other RCRA characteristically hazardous wastes (e.g. metals or RCRA-listed chemicals) ! Exclusion potentially applies to: – 19 specific RCRA F-listed chemical solvents (and corresponding P- and U-listed commercial chemical products) – ignitable-only (D001) characteristically hazardous solvents	! All RCRA-listed hazardous solvents
2	Containers for on-site accumulation of solvent wipes	! Accumulate in non-leaking covered containers	! Accumulate in non-leaking covered containers ! Must recycle 75% of spent wipes in calendar year
3	Containers for spent solvent wipes transportation	! Transport in non-leaking & non-evaporative loss containers *"designed, constructed and managed to minimize loss to the environment"*: – covered drums (sealed drums not required) if meet above if meet above performance standard – cinched plastic or cinched cloth bags if meet above performance standard – comply with USDOT packaging 49 CFR 173.212	
4	Labels for transport containers	! Label all transport containers with *"Excluded Solvent-Contaminated Wipes"*	! RCRA labels not required on containers

Item	Exclusion Condition	Conditions for RCRA Exclusions	
		Disposable Wipes (exclusion from RCRA definition of hazardous waste)	Reusable Wipes (exclusion from RCRA definition of solid waste)
5	Pre-transport preparation of spent solvent wipes to meet "*no free liquids*"	! Either: ! If transport for (a) disposal in municipal or other combustion unit**, or (b) intermediate processing to meet "*dry*" standard (i.e. < 5 grams (i.e. less than 0.175 ounces) solvent per wipe), spent wipes and transport containers must meet "*no free liquids*" condition (i.e. contain no dripping wipes and no solvents at bottom of container) ! If transport for disposal at non-haz waste landfill**, spent solvent wipes must meet "*dry*" condition (i.e. less than five grams solvent per wipe) by either: – spent wipes solvent centrifuge/extraction – business records on solvent & wipes monthly use to show under "*dry*" threshold – spent wipes solvent sampling to show under threshold ! Removed spent solvents must be managed as hazardous wastes*	! Containers meet "*no free liquids*" (i.e. contain no dripping wipes and no solvents at bottom of container) ! Removed spent solvents must be managed as hazardous wastes if RCRA-listed or characteristic hazardous*

Item	Exclusion Condition	Conditions for RCRA Exclusions	
		Disposable Wipes (exclusion from RCRA definition of hazardous waste)	Reusable Wipes (exclusion from RCRA definition of solid waste)
6	Intra-company transfers of spent solvent wipes to remove "*free liquids*"	! May transport wipes containing "*free liquids*": – if store/accumulate in covered containers – if transport in non-leaking & non-evaporative loss containers – if containers are RCRA-labeled – if within the same company – if receiving facility uses solvent recovery process – if recovered solvents sold on market for reuse or managed as hazardous waste*	! May transport wipes containing "*free liquids*": – if store/accumulate in covered containers – if transport in non-leaking & non-evaporative loss containers – RCRA labels not required – if within the same company – if receiving facility uses solvent recovery process – if recovered solvents sold on market for reuse or managed as hazardous waste*
7	Transfer spent solvent wipes to offsite handler to remove "*free liquids*"	Same as item 6	Same as item 6

Item	Exclusion Condition	Conditions for RCRA Exclusions	
		Disposable Wipes (exclusion from RCRA definition of hazardous waste)	Reusable Wipes (exclusion from RCRA definition of solid waste)
8	Subsequent off-site management of spent solvent wipes after transport	! Wipes containers: Store spent solvent wipes received in non-leaking & non-evaporative covered containers ! Wipes disposal: – If spent wipes are "*dry*" and contaminated with any of 19 specific F-listed solvents, may be disposed in municipal or other non-haz waste landfill**. – If spent wipes meet "*no free liquids*" standard, may be disposed at municipal waste combustor**, or transported for processing to meet "*dry*" standard. – If receive spent wipes containers with "*free liquids*" either: – return containers (with wipes and liquids) to generator ASAP (but not need a haz waste manifest) – recover/manage "*free liquids*" as hazardous waste*	! Wipes containers: Store spent solvent wipes received in non-leaking & non-evaporative covered containers ! Wipes processing (laundering): – May launder spent wipes meeting "*no free liquids*" standard. – If receive spent wipes containers with "*free liquids*" either: – return containers (with wipes and liquids) to generator ASAP (but not need a haz waste manifest) – recover & manage "*free liquids*" as hazardous waste*
9	Compliance recordkeeping	! Comply with existing RCRA documentation requirements (40 CFR 261.2(f)) for demonstration of exclusion eligibility from RCRA regulation (which requires providing appropriate documentation such as business contracts that the material is not a waste).***	
10	Other possible impacts	! Read, disseminate & assess compliance requirements of exclusions ! Possible reduction in annual state fees/taxes paid for generating & managing spent solvent wipes (note: state fee impacts are a type of "*transfer effect*", not a "*real resource economic*" effect).	

Item	Exclusion Condition	Conditions for RCRA Exclusions	
		Disposable Wipes (exclusion from RCRA definition of hazardous waste)	Reusable Wipes (exclusion from RCRA definition of solid waste)

Explanatory Notes:

(a) The USEPA's Office of Solid Waste RCRA hazardous waste program defines "*free liquids*" as "*liquids which readily separate from the solid portion of a waste under ambient temperature and pressure*" (40 CFR 260.10).

(b) * Spent solvent "*free liquids*" must be managed as RCRA hazardous waste if the spent solvent is a 40 CFR 261.31 RCRA-listed hazardous waste, or if it is a 40 CFR 261 Subpart C RCRA-characteristic hazardous waste. As of 1997, there were over 46 RCRA hazardous waste management facilities (LQGs) which received spent solvent hazardous waste from offsite sources for solvent recovery onsite, according to the following solvent recovery technologies (source: USEPA Office of Solid Waste, 1997 Hazardous Waste "Biennial Report" database query at http://www.epa.gov/enviro/html/brs/brs_query.html):

Type of solvent recovery technology	Facilities	Nr. states
! Solvent fractionation/distillation (M021)	46	22
! Thin film solvent evaporation (M022)	26	10
! Solvent extraction (M023)	11	10
! Other solvent recovery (M024/M029)	16	12

(c) ** Non-hazardous waste facilities in the US: as of year 1999 there are an estimated (source: "Size of the United States Solid Waste Industry", R.W. Beck & Chartwell Information Publishers, Environmental Research & Education Foundation, March 2001, Table 7, p.19):

- ! 3,500 active material recovery/recycling facilities
- ! 3,200 active municipal solid waste landfills
- ! 3,100 active solid waste transfer stations
- ! 140 active solid waste combustion/ incineration facilities

(d) *** USEPA RCRA compliance protocols (guidance) are available at:

- ! For non-hazardous solid waste generator facilities: "Protocol for Conducting Environmental Compliance Audits of Facilities Regulated Under Subtitle D of RCRA", USEPA Office of Enforcement Compliance & Assurance (OECA), EPA-300-B-00-001, March 2000, 153 pages, http://www.epa.gov/compliance/resources/policies/incentives/auditing/rcradfi.pdf
- ! For hazardous solid waste generator facilities: "Protocol for Conducting Environmental Compliance Audits for Hazardous Waste Generators Under RCRA", USEPA Office of Enforcement Compliance & Assurance (OECA), EPA-305-B-01-003, June 2001, 178 pages, http://www.epa.gov/compliance/resources/policies/incentives/auditing/hazardous.pdf (regulatory requirement HW.10.2 on page 26 provides a checklist for documenting that a particular material is not a solid waste or is exempt from hazardous waste regulation).
- ! For hazardous solid waste treatment, storage, disposal, recycling facilities: "Protocol for Conducting Environmental Compliance Audits of Treatment, Storage and Disposal Facilities Under the Resource Conservation & Recovery Act", USEPA Office of Enforcement Compliance & Assurance (OECA), EPA-305-B-98-006, Dec 1998, 246 pages, http://www.epa.gov/compliance/resources/policies/incentives/auditing/rcra.pdf

I.D. Overview of Industrial Wipes Market

US Industrial Wipes Market (Year 2001)		
Market & Affected Sub-Markets	Wipes Quantities	Wipes Facilities (Users & Handlers)
US industrial wipes market (with & w/out solvents applied)	**9.6 billion annual wipes uses** ! 88% reusables (8.5 billion used) ! 12% disposables (1.1 billion sold)	**471,000 users** (i.e. spent wipes generators) ! 13 economic sub-sectors (see next table) ! 83% small company facilities ! 15% printers + 85% non-printers
		1,200 industrial laundries supply reusables ! $408 million/year revenues from resusables ! 47% small company facilities
Solvent industrial wipes sub-market (CESQGs+SQGs+LQGs)	3.8 billion wipes per year (40% of US industrial wipes market)	215,000 users + handler facilities
Portion of industrial wipes sub-market potentially affected (only SQGs+LQGs)	2.8 billion wipes per year (33% of US industrial wipes market ! 2.55 billion reusables used ! 259 million disposables sold	68,000 to 164,000 users + handler facilities

I.E. Summary Count of Potentially Affected Establishments

Economic Sub-Sectors Which Use or Otherwise Handle Industrial Wipes					
Item	Sub-Sector	2001 Estimate of All Establishments* (by NAICS code)	2001 Estimate of Establishments (SQGs + LQGs) Using RCRA Solvent Wipes & Potentially Eligible for the Exclusions**		
			Lower-bound	Most-Likely	Upper-bound
A. Count of Establishments (Facilities) Which Use Solvent Industrial Wipes (i.e. spent wipes generators***):					
1	Printing	41,600	18,700	31,200	42,000
2	Chemical & Allied Products	13,700	1,100	1,900	2,900
3	Plastics & Rubber	17,900	1,400	2,400	3,700
4	Fabricated Metal Products	63,800	4,900	8,600	13,000
5	Industrial Machinery & Equipment	31,100	2,400	4,100	6,300
6	Electronics & Computers	6,600	550	1,000	1,500
7	Transportation Equipment	13,900	1,100	2,000	3,000
8	Furniture & Fixtures	21,100	1,600	2,800	4,300
9	Automobile Dealers (retail trade)	51,900	4,000	7,000	10,700
10	Publishing (printed matter)	23,600	10,600	17,700	23,600
11	Business Services (copy shops)	6,400	2,900	4,800	6,400
12	Automobile Repair & Maintenance	179,300	13,500	23,500	35,900
13	Military Bases	560	50	90	130
	Column sub-totals =	471,000	63,000	**107,000**	153,000
B. Count of Establishments Which Otherwise Handle Spent Solvent Industrial Wipes:					
14	Industrial Laundries (reusable wipe suppliers)	1,175	590 (if 50% states)	880 (if 75% states)	1,175 (if 100% states)
15	Solid Waste Management facilities	10,600	5,300 (ibid)	8,000 (ibid)	10,600 (ibid)
	Column totals =	**482,000**	**68,900**	**115,800**	**164,800**

Explanatory Notes:

(a) * Items 1-13 based on 1997 Census count, updated by OSW using the 15-year average annual percentage change in the Industrial Production Index (IPI) for 1986 to 2000; items 14 & 15 from the 1997 Census without update.

(b) ** "*Lower-bound*", "*Most-likely*" and "*Upper-bound*" in this document represent uncertainty about (a) numerical values for key estimation parameters applied in this study, and (b) the percentage of states which will likely adopt the exclusions (i.e. 50%, 75%, and 100% states, respectively).

(c) *** Counts of spent wipes generators in this table only includes facilities which are potentially classifiable as RCRA "large quantity generators" (LQGs) or as "small quantity generators" (SQGs), excluding facilities potentially classifiable as "conditionally-exempt small quantity generators" (CESQGs), based on the average calendar month quantity of spent solvent generation associated with industrial wipes applications.

II. Findings of Economic Analysis

II.A. Annualized Direct Impacts of Main Regulatory Proposal

The following table summarizes the "***direct impact***" elements of the proposed exclusions (i.e. the main proposal, not the options), as quantified and monetized in this report. Direct impacts are defined as the economic costs of implementation activities and requirements that eligible or otherwise affected entities (i.e. entities eligible and subject to the proposed exclusion conditions) are expected to incur in compliance with the proposed exclusions. Direct impacts may occur in the initial year following finalization of the proposed exclusions, as well as in subsequent years on an annual recurring basis. As indicated in the table, some elements are expected to impact some users/handlers differentially, according to type of industrial wipe (i.e. reusable or disposable wipe), because of differences in the current spent wipes management practices – as a result of current state regulations – between generators of spent reusable wipes, compared to generators of spent disposable wipes.

Summary of Annualized Direct Impact Elements:
Estimated Potential Incremental Costs and Cost Savings
to Solvent-Contaminated Industrial Wipes Generators & Handlers for Compliance With the Proposed Exclusions
! **Estimates Below Based on "*Most Likely*" Uncertainty Parameter Settings**
! **Dollar Impacts in Parentheses Below (i.e. Negative Costs) Denote Cost Savings or Other Economic Benefits**

Item	Direct Impact Element		Potential Average Annualized* Impact ($/year) on Spent Wipes Generators & Other Handlers**		
			Disposable Wipes	Reusable Wipes	Net Impact (row totals)
1. Wipes solvent eligibility	1A. Determine eligibility (i.e. read/disseminate scope, applicability & conditions of exclusions)	Solvent wipes generators >	$58,000	$774,000	$832,000
		Other handlers (e.g. solid waste mgmt, laundries)>	$13,000	$4,000	$17,000

Item	Direct Impact Element		Potential Average Annualized* Impact ($/year) on Spent Wipes Generators & Other Handlers**		
			Disposable Wipes	Reusable Wipes	Net Impact (row totals)
	1B. Contact/assess RCRA regulatory status of reusable wipes customers (i.e. determine solvent types applied to wipes)	Cost to laundries >	Not applicable	$262,000	$262,000
		Cost to laundry customers >		$218,000	$218,000
2. Onsite wipes containers	Covered containers for on-site accumulation of spent solvent wipes by generators (assumes purchase of steel foot-lever closeable solvent wipes canisters)		$1,130,000	$1,617,000	$2,747,000
3. Wipes transport containers	3A. Closed containers for spent wipes transport	If tied plastic bags >	$19,000 to	$499,000 to	$518,000 to
		If closable metal drums >	$2,836,000	$1,094,000	$3,930,000
	3B. Avoided RCRA manifest paperwork for spent wipes		($3,455,000)	$0 (baseline)	($3,455,000)
4. Transport container labels	Labels for wipes transport containers & labor affix cost	If tied plastic bags >	$61,000 to	Not required	$61,000 to
		If closable metal drums >	$80,000		$80,000
5. Pre-transport preparation of wipes	5A. Labor cost for decanting accumulation containers		$22,000	$6,201,000	$6,223,000
	5B. Haz waste mgt cost for decanted solvents	Manifest & transport >	$0 (include on manifest & truck with other wastes)		
		If fuel blender >	$8,000 to	$2,873,000 to	$2,881,000 to
		If solvent recycler# >	($6,000)	($2,326,000)	($2,332,000)
	5C. Wipes sampling to meet “dry” standard (sampling not required; may use business records or extraction***).		$69,000	Not applicable	$69,000

Item	Direct Impact Element			Potential Average Annualized* Impact ($/year) on Spent Wipes Generators & Other Handlers**		
				Disposable Wipes	Reusable Wipes	Net Impact (row totals)
6. Intra-company transfers	Intra-company transfers of spent wipes containing "*free liquids*", for recovery & management of solvent as haz waste			$4,000 to $146,000	Not expected if laundries control wipes handling & distribution	$4,000 to $146,000
7. Transfers to offsite handler	Transfer to an intermediate handling facility (another company) to remove & manage "*free liquids*" as haz waste			$4,000 to $146,000		$4,000 to $146,000
8. Offsite management of wipes	Subsequent off-site management of spent solvent wipes (and "*free liquids*") after transport	8A. Avoided Subtitle C disposal of spent wipes		($32,971,000)	Not applicable	($32,971,000)
		8B. Labor for decanting percolated "*free liquids*"		$10,000	$121,000	$131,000
		8C. Manage percolated "*free liquids*" as haz waste	Manifest & truck >	$0 (remain onsite)	$1,514,000	$1,514,000
			If fuel blender > If solvent recycler# >	$10,000 to ($8,000)	$187,000 to ($151,000)	$197,000 to ($159,000)
9. Compliance record-keeping	9A. Demonstrate RCRA exclusion to inspectors (per 40 CFR 261.2(f))	Cost to wipes generators>		$3,000	$33,000	$37,000
		Cost to other handlers >		$152,000	<$1,000	$152,000
		Cost to state agencies>		$52,000	$380,000	$432,000
	9B. Avoided RCRA paperwork costs to SQGs that may become CESQGs			($784,000)	$0 (baseline)	($784,000)

Item	Direct Impact Element	Potential Average Annualized* Impact ($/year) on Spent Wipes Generators & Other Handlers**		
		Disposable Wipes	Reusable Wipes	Net Impact (row totals)
Sub-total annualized implementation impacts (items 1 to 9; range reflects low-cost and high-cost options, respectively) =		**($32.5) to ($35.6) million/year**	**$9.1 to $15.3 million/year**	**($17.2) to ($26.5) million/year**
Potential fraction of reusable wipes impacts incurred by industrial laundries (range reflects low-cost options of 1A+1B+3A+4+5B+8B+8C+9A, to if also include item 5A + high-cost options, respectively)			**($0.1) to $12.3 million/year**	
10. Impact on state government annual revenues from waste fees****		($29.7 to ($41.0) million/year	($2.4) to ($5.7) million/year	($32.1) to ($46.7) million/year
11. Other potential impacts on industrial laundries	11A. Cachet benefit to industrial laundries from avoided waste "*stigma*" for reusable wipes	Not applicable	($3.4) to ($6.9) million/year	
	11B. Avoided RCRA Subtitle C paperwork costs to industrial laundries (under alternative baseline)		($1.5) to ($3.0) million/year	
	11C. Avoided costs for managing industrial laundry sludges as RCRA "*derived-from*" haz wastes (under alternative baseline)		($46 to ($92) million/year	

Item	Direct Impact Element	Potential Average Annualized* Impact ($/year) on Spent Wipes Generators & Other Handlers**		
		Disposable Wipes	Reusable Wipes	Net Impact (row totals)

Explanatory Notes:

(a) * Annualized impacts include both:

- Initial lump-sum impacts in first implementation year after final rule promulgation (e.g. equipment purchase costs), plus
- Net-effect of recurring annual expenses or savings (e.g. equipment operation or maintenance costs).

(b) ** Other handlers = Solid waste management establishments + industrial laundries which supply reusable industrial wipes.

(c) *** Depending upon economy-of-scale and market value of recovered solvent, the cost for solvent extraction (e.g. using centrifugation) of solvent-contaminated wipes may be a relatively more expensive option for many industrial wipes generators, compared to decanting "*free liquids*". However, some industrial facilities already use on-site centrifuge technology to extract spent solvents from industrial wipes. For example, the Printing Industry of Minnesota, Inc. purchased a $15,000 centrifuge to spin its reusable industrial wipes before sending them to the industrial laundry, extracting 2.5 to 3.5 gallons of spent solvent for every centrifuge load of about 220 reusable wipes. The company reuses the captured solvent, thereby saving $34,000/year from avoided purchase of one drum/week of virgin solvent (source: USEPA Design for the Environment: Lithography Project Case Study No.1, Oct 1995, 4 pages, http://www.epa.gov/opptintr/dfe/pubs/lithography/case_studies/case1/lithocs1.pdf).

(d) **** State fee impacts represent a form of "*transfer payment*" (i.e. not a form of real resource economic cost) which are not traditionally included (combined) with estimates of "*real resource*" costs/savings, in a national economic analysis framework.

(e) # Solvent recycling impact estimated by subtracting $2.54/gallon unit cost for solvent recycling (average for onsite & offsite), from the $3.28/gallon US median solvent price to reflect $0.74/gallon resale (reuse) net value of recycled solvent; $1.73/gallon recycling cost represents midpoint between:

- onsite recycling cost of $1.00/gallon (http://rapidimaging.com/TSR/TSR%20R-07%20Platemaking%20Productivity%20for%20Web.pdf).
- offsite vendor recycling service price of $2.45/gallon (http://www.iwrc.org/pubs/IPPIMetal.pdf), and $4.16/gallon (http://www.epaonline.com/enews.html, 14 April 2003).

(f) ## Re-containerization costs (either for new containers if initial transport containers owned by generator, and/or for labor if using consolidation re-containerization into existing 20 cubic yard truck roll-offs), and associated re-containerization labeling costs, estimated for both intra-company transfer (item 6) and transfer to offsite handler (item 7), by multiplying wipes transport container costs (item 3A) and wipes transport container label costs (item 4), by 5%, which represents assumption that 5% of disposables (not reusables) may be transported for intra-company processing, and another 5% of disposables (not reusables) may be transported to an offsite handler (another company).

II.B. Potential First-Year Implementation Impact

The direct impacts in the table above are "*average annualized*" impacts, consisting of the sum of (a) single-year (upfront lump-sum) impacts which have been annualized into a uniform future stream according to the "*equivalent uniform annual cost*" (i.e. equal-payment-series "*capital recovery factor*") method, plus (b) annually-recurring impacts. The table below presents the potential first-year (lump-sum) impacts without annualization.

Summary of First-Year Direct Impact Elements:
Estimated Potential Incremental Costs and Cost Savings
to Solvent-Contaminated Industrial Wipes Generators & Handlers for Compliance With the Proposed Exclusions
! **Estimates Below Based on "*Most Likely*" Uncertainty Parameter Settings**
! **Dollar Impacts in Parentheses Below (i.e. Negative Costs) Denote Cost Savings or Other Economic Benefits**

Item	Direct Impact Element		Potential First-Year Impact on Spent Wipes Generators & Other Handlers**		
			Disposable Wipes	Reusable Wipes	Net Impact (row totals)
1. Wipes solvent eligibility	1A. Determine eligibility (i.e. read/disseminate scope, applicability & conditions of exclusions)	Spent wipes generators >	$439,000	$5,815,000	$6,254,000
		Other wipes handlers >	$96,000	$26,000	$122,000
	1B. Contact/assess RCRA regulatory status of reusable wipes customers (i.e. determine solvent types applied to wipes)	Cost to laundries >	Not applicable	$735,000	$735,000
		Cost to laundry customers >		$613,000	$613,000
2. Onsite wipes containers	Covered containers for on-site accumulation of spent solvent wipes by generators (assumes purchase of metal foot-lever closeable canisters)		$5,694,000	$8,146,000	$13,840,000

Item	Direct Impact Element		Potential First-Year Impact on Spent Wipes Generators & Other Handlers**		
			Disposable Wipes	Reusable Wipes	Net Impact (row totals)
3. Wipes transport containers	3A. Closed containers for spent wipes transport	If tied plastic bags >	$19,000 to	$499,000 to	$518,000 to
		If closable metal drums >	$12,442,000	$4,801,000	$17,243,000
	3B. Avoided RCRA manifest paperwork for spent wipes		($3,455,000)	$0 (baseline)	($3,455,000)
4. Transport container labels	Labels for wipes transport containers & labor affix cost	If tied plastic bags >	$61,000 to	Not required	$61,000 to
		If closeable metal drums >	$702,000		$702,000
5. Pre-transport preparation of wipes	5A. Labor cost for decanting accumulation containers		$22,000	$6,201,000	$6,223,000
	5B. Haz waste mgt cost for decanted solvents	Manifest & truck waste >	$0 (include on manifest & truck with other wastes)		
		If fuel blender >	$8,000 to	$2,873,000 to	$2,881,000 to
		If solvent recycler# >	($6,000)	($2,326,000)	($2,332,000)
	5C. Wipes sampling to meet "dry" standard (sampling not required; may use business records or extraction***)		$520,000	Not applicable	$520,000
6. Intra-company transfers	Intra-company transfers of spent wipes containing "*free liquids*", for recovery & management of solvent as haz waste		$4,000 to $657,000	Not expected if laundries control wipes handling & distribution	$4,000 to $657,000
7. Transfers to offsite handler	Transfer to an intermediate handling facility (another company) to recover & manage "*free liquids*" as haz wastes		$4,000 to $657,000		$4,000 to $657,000
8. Offsite management of wipes	Subsequent off-site management of spent solvent wipes and any percolated "*free liquids*" after transport	8A. Avoided Subtitle C disposal of spent wipes	($32,971,000)	Not applicable	($32,971,000)

Item	Direct Impact Element			Potential First-Year Impact on Spent Wipes Generators & Other Handlers**		
				Disposable Wipes	Reusable Wipes	Net Impact (row totals)
		8B. Labor for decanting percolated "*free liquids*"		$10,000	$121,000	$131,000
		8C. Manage percolated "*free liquids*" as haz waste	Manifest & truck >	$0 (remain onsite)	$1,514,000	$1,514,000
			If fuel blender > If solvent recycler# >	$10,000 to ($8,000)	$187,000 to ($151,000)	$197,000 to ($159,000)
9. Compliance record-keeping	9A. Demonstrate RCRA exclusion to inspectors (per 40 CFR 261.2(f))	Cost to wipes generators>		$3,000	$33,000	$37,000
		Cost to other handlers>		$152,000	<$1,000	$152,000
		Cost to state agencies>		$52,000	$380,000	$432,000
	9B. Avoided RCRA paperwork costs to SQGs that may become CESQGs			($784,000)	$0 (baseline)	($784,000)
Sub-total first-year implementation impacts (items 1 to 9; range reflects low-cost & high-cost options, respectively) =				**($15.8) to ($30.2) million**	**$21.6 to $31.5 million**	**($8.5) to $15.7 million**
Potential fraction of reusable wipes impacts incurred by industrial laundries (range reflects low-cost options of 1A+1B+3A+4+5B+8B+8C+9A, to if also include item 5A + high-cost options, respectively)					**$0.4 to $16.5 million**	
Note: for explanatory footnotes, see previous table.						

II.C. Other Benefits of the Proposed Exclusions

Other Potential Benefits of the Proposed Rule In Addition to RCRA Regulatory Compliance Burden Reduction				
Direct Impact Item (from table above)	Associated Non-Monetary Benefit Element	Disposable Wipes	Reusable Wipes	Row Totals
A. Environmental & Human Health Benefits:				
Pre-transport preparation of spent wipes	Solvent "*free liquids*" captured by decanting from accumulation containers	32 tons/year (8,300 gallons/year)	12,270 tons/year (3,146,000 gallons/year)	12,300 tons/year (3,154,000 gallons/year)
Offsite management of transported spent wipes	Solvent "*free liquids*" captured by decanting from transportation containers	42 tons/year (11,000 gallons/year)	797 tons/year (204,000 gallons/year)	839 tons/year (215,000 gallons/year)
	Column totals =	74 tons/year (19,300 gallons/year)	13,067 tons/year (3.35 million gallons/year)	13,139 tons/year*** (3.37 million gallons/year)
	Potential human health benefit* =	$0.05 to $0.21 million/year	$8.0 to $36.2 million/year	$8 to $36.4 million/year
B. Fire Safety Benefits:				
Structure-related fires attributed to spontaneous ignition of "*oily wipes*"**		$0.04 to $1.1 million/year	$0.26 to $8.1 million/year	$0.3 to $9.2 million/year
	Total other benefits (A + B) =	$0.09 to $1.3 million/year	$8.3 to $44.3 million/year	$8.3 to $45.6 million/year

Explanatory Notes:

(a) * In addition to potential annual cost savings benefit for avoiding future purchases of virgin solvents if captured spent solvent "*free liquids*" are recycled, the potential environmental benefit of capturing (removing) the annual solvent quantities displayed in this table, from loading either into the air, land, or surface waters (via evaporation/volatilization, spills/leakages, or laundry effluent wastewaters, is not monetized in this table, but may also be significant. USEPA is targeting the national reduction in urban air emissions of at least six industrial solvents (i.e. benzene, carbon tetrachloride, chloroform, methyl chloride, methylene chloride, tetrachloroethylene, trichloroethylene, and 27 other chemicals) that present the greatest threat to public health in the largest number of US urban areas, many of which are emitted from smaller stationary commercial and industrial operations ("National Air Toxics Program: The Integrated Urban Strategy", Federal Register, Vol.64, No.137, 19 July 1999). Many chemical solvents are volatile organic compounds (VOCs) which when released into the environment may become precursors to formation of ground-level ozone. For example, solvent and paint VOCs are the second largest contributor (18%) to ozone pollution in the four county region surrounding Los Angeles, with on-road vehicles (49%), trains/planes (13%), power plants & other fuel-burning industries (11%), and other sources (9%); source: http://www.wastenews.com, 09 April 2003. For purpose of monetization, this table applies a unit value benefit range of **$612 to $2,767 per ton** (1998$) "*free liquids*" solvent captured, which is the unit value for VOC emissions reduction health benefits USEPA applied in three recent rulemakings:

- 1997: USEPA Office of Air & Radiation, "Regulatory Impact Analyses for the Particulate Matter and Ozone National Ambient Air Quality Standards and Proposed Regional Haze Rule", http://www.epa.gov/ttn/oarpg/naaqsfin/ria.html.
- 1998: USEPA Office of Water, "Environmental Assessment of the Final Effluent Limitations Guidelines and Standards for the Pharmaceutical Manufacturing Industry", EPA-821-R-B-98-008, 30 July 1998, http://www.epa.gov/ost/guide/pharm/econanal/econanal.pdf.
- 2000: USEPA Office of Water, "Effluent Guidelines for the Oil and Gas Extraction Point Source Category: Proposed Rule", Federal Register, Vol.65, No.78, 21 April 2000, p.21567, http://www.epa.gov/waterscience/guide/sbf/sbfnoda.pdf.

In comparison, two other recent (2001 & 2002) economic studies applied a range of $340 to $2,000 per ton for VOC air emission reduction health benefits (http://www.tc.gc.ca/programs/environment/urbantransportation/transitstudies/docs/Cost-Benefit.pdf; and http://www.translink.bc.ca/files/mae_report/appendix_airemission_eval.pdf).

(b) ** Source for "*oily wipes*" fire damages: See Section V.F "Damage Cases Associated With Solvent-Contaminated Industrial Wipes" of the Technical Background Document identified in the preamble for this rulemaking. OSW derived benefit range to reflect unknown contributions of (1) solvent "free liquids" wipes or (2) "no free liquids" wipes, to annual fire damage cases; and applied the relative marketshare (88% reusables:to:12% disposables) to estimate proporational share of wipe types in fire damages incidents:

- Upper-bound: Spent solvent wipes share of $40.2 million/year damages associated with "*oily wipes*" (from source document), assigned in proportion to estimate of solvent wipes share of 471,000 total US establishments in 13 industrial subsectors using industrial wipes with & without RCRA solvents (107,000/471,000 establishments = 23%).
- Lower-bound: Assumes that only 3.5% of upper-bound damages attributed to solvent wipes, which represents the overall average percentage of wipes containers estimated arriving at final destinations with solvent "free liquids".

(c) *** For benchmarking, this estimated quantity of solvent "free liquids" potentially captured in closed accumulation and transport containers, represents 13% to 16% of the estimated 82,000 to 103,000 tons/year of solvents applied to industrial wipes. Compared to 25% to 40% solvent evaporative loses (i.e. 20,500 to 41,200 tons/year), this "free liquids" capture quantity represents potential reduction in evaporative loss by 32% to 64%, if non-captured "free liquids" would completely evaporate from uncovered containers.

II.D. Benefit-Cost Comparison

Comparison of Annualized Benefits of Regulatory Exclusions to Annualized Direct Implementation Costs for Meeting Exclusion Conditions
Note: numbers in parentheses denote benefits or cost savings

Item	Impact Indicator	Average Annualized Impacts ($millions)		
		Disposable Wipes	Reusable Wipes	Net Impact (row totals)
1	Direct implementation costs for meeting conditions of regulatory exclusions	$1.59 to $4.73	$11.63 to $15.28	$13.22 to $20.01
2	Regulatory compliance cost savings (and/or solvent capture reuse value) resulting from conditional exclusions	($37.22)	($2.48)	($39.70)
3	Other annualized benefits (environmental, human health & fire safety)	($0.09) to ($1.3)	($8.3) to ($44.3)	($8.3 to $45.6)
4	Total annualized benefits (2 + 3) =	($37.3) to ($38.5)	($10.8) to ($46.8)	($48.0 to $85.3)
5	Net effect = Net benefits (4 - 1) =	($32.6) to ($36.9)	($35.2) to $4.5	($28.0) to ($72.1)
6	Benefit-cost ratio (4 / 1) =	**7.9 to 24.2**	**0.7 to 4.0**	**2.4 to 6.5**

Explanatory Note:
The annualized direct implementation costs (item 1), the total annualized benefits (item 4), and the net annual effect (item 5) do not exceed Executive Order 12866's $100 million "*annual effect*" threshold, so the proposed exclusions are not classifiable as an economic "*major rule*" (http://www.whitehouse.gov/omb/inforeg/eo12866.pdf).

II.E. Potential Direct Impacts of Regulatory Options

Alternative Regulatory Options Described in the Federal Register Announcement for the Proposed Exclusion			
Direct Impact Element	Alternative Regulatory Option	Potential Economic Impacts of Regulatory Options	
		Disposable Wipes	Reusable Wipes
1. Wipes solvent eligibility	Provide RCRA hazardous waste exclusion for all disposable solvent-contaminated wipes	! Removes landfill constraint for estimated 11% of solvent wipes under main proposal. ! Increases potential annual disposal cost savings by a factor of 1.12 (i.e. 100% / (100%-11%)).	Not applicable
2. Onsite wipes storage containers	Rely on existing OSHA regulations for storing flammable or combustible liquids, wastes, residues, in covered containers or tanks.	Real resource (economic) impact same as main proposal, regardless of whether RCRA or OSHA regulations cited.	
3. Wipes transport containers	Transport in impermeable closed (sealed) containers	! Assume "sealed" container costs are similar to metal drum costs estimated for main proposal. ! Sealed containers may unintentionally result in redistribution of *free liquid* management costs estimated for the main proposal, from spent wipes generators, to waste management facilities (disposal wipes) or industrial laundries (reusable wipes), if free liquids form from solvent condensation or solvent gravity flow inside containers, after generator seals containers prior to transporting off-site.	
4. Wipes transport container labels	Do not require a RCRA-specific label	Eliminates cost associated with this element of main proposal	Labels not required under main proposal

Direct Impact Element	Alternative Regulatory Option	Potential Economic Impacts of Regulatory Options	
		Disposable Wipes	Reusable Wipes
5. Wipes pre-transport preparation	*"No free liquids when wrung"* to qualify for exclusion	$0.3 to $1.1 million annual cost to wipes generators for wringing wipes prior to transport (source: spreadsheet attachment)	$2.2 to $8.1 million annual cost to wipes generators (or laundry pick-up) for wringing wipes prior to transport (source: factored 88/12 relative to disposables estimate).
6. Intra-company transfer of wipes	One-time notification of transfer activities to state agencies	! Cost to wipes generators: (5,058 to 12,483 disposable wipes generators) x (5% engage in transfer*) x ($105/facility) = $27,000 to $66,000 one-time cost. ! Cost to states to review notice: – Initial: (same number of facilities above) x ($30/notification) = $8,000 to $19,000. – Annual subsequent: 55% of initial cost = $4,400 to $10,500 per year.	! Cost to wipes generators: (57,633 to 140,379 reusable wipes generators) x (5% engage in transfer*) x ($105/facility) = $0.30 to $0.74 million one-time cost. ! Cost to states to review notice: – Initial: (same number of facilities above) x ($30/notification) = $87,000 to $211,000. – Annual subsequent: 55% of initial cost = $48,000 to $116,000 per year.
	Maintain business records about wipes transferred	Assume $0 additional cost because based on business records which are usually retained for at least 3 years for tax reporting or other legal purposes.	
	Comply with RCRA employee training	(5,058 to 12,483 disposable wipes generators) x (5% engage in transfer*) x ($5,000/facility/year**) = $1.3 to $3.1 million/year	(57,633 to 140,379 reusable wipes generators) x (5% engage in transfer*) x ($5,000/facility/year**) = $14.4 to $35.1 million/year.

Direct Impact Element	Alternative Regulatory Option	Potential Economic Impacts of Regulatory Options	
		Disposable Wipes	Reusable Wipes
	Transfer wipes in sealed containers	! Assume "sealed" container costs are similar to metal drum costs estimated for main proposal. ! Sealed containers may unintentionally result in redistribution of free liquid management costs estimated for the main proposal, from spent wipes generators, to waste management facilities (disposal wipes) or industrial laundries (reusable wipes), if free liquids form from solvent condensation or solvent gravity flow inside containers, after generator seals containers prior to transporting off-site.	
7. Transfer to offsite handler (different company)	One-time notification of transfer activities to state agencies	! Cost to wipes generators: (5,058 to 12,483 disposable wipes generators) x (5% engage in transfer*) x ($105/facility) = $27,000 to $66,000 one-time cost. ! Cost to states to review notice: – Initial: (same number of facilities above) x ($30/notification) = $8,000 to $19,000. – Annual subsequent: 55% of initial cost = $4,400 to $10,500 per year.	$0 (assume industrial laundries maintain complete control over reusable wipes handling)
	Maintain business records about wipes transferred	Assume $0 additional cost because based on business records which are usually retained for at least 3 years for tax reporting or other legal purposes.	$0 (assume industrial laundries maintain complete control over reusable wipes handling)
	Comply with RCRA employee training	(5,058 to 12,483 disposable wipes generators) x (5% engage in transfer*) x ($5,000/facility/year**) = $1.3 to $3.1 million/year	$0 (assume industrial laundries maintain complete control over reusable wipes handling)

Direct Impact Element	Alternative Regulatory Option	Potential Economic Impacts of Regulatory Options	
		Disposable Wipes	Reusable Wipes
	Transfer wipes in sealed containers	! Assume "sealed" container costs are similar to metal drum costs estimated for main proposal. ! Sealed containers may unintentionally result in redistribution of free liquid management costs estimated for the main proposal, from spent wipes generators, to waste management facilities (disposal wipes) or industrial laundries (reusable wipes), if free liquids form from solvent condensation or solvent gravity flow inside containers, after generator seals containers prior to transporting off-site.	$0 (assume industrial laundries maintain complete control over reusable wipes handling)
8. Offsite management of wipes	See element 1 above affecting eligibility for landfilling disposable wipes	See element 1 above	Not applicable

Direct Impact Element	Alternative Regulatory Option	Potential Economic Impacts of Regulatory Options	
		Disposable Wipes	Reusable Wipes
9. Compliance record-keeping	Certify that solvent wipes shipments meet either "*no free liquids*" or "*dry*" conditions.	– Assume 145,000 spent wipes containers/year transported equals 18,000 truck shipments/year. – Assume each shipment requires 0.25 hours labor time for certification & recordkeeping by generator: (18,000 shipments) x (0.25 hours) x ($22/hour) = $99,000/year – Assume each shipment equally requires 0.25 hours labor time for certification & recordkeeping by receiver: $99,000/year	– Assume 2.7 million spent wipes containers/year transported equals 335,000 truck shipments/year. – Assume each shipment requires 0.25 hours labor time for certification & recordkeeping by generator: (335,000 shipments) x (0.25 hours) x ($22/hour) = $1.84 million/year. – Assume each shipment equally requires 0.25 hours labor time for certification & recordkeeping by receiver: $1.84 million/year.
	Streamlined RCRA manifest for returning wipes with free liquids to generators	– Assume streamlined manifest is 15% social cost of traditional manifest: ($300/manifest***) x $15% = $45/manifest. – (18,000 truck shipments/year) x (3.5% contain free liquids) x ($45/manifest) = $28,400/year.	$0; assumes that industrial laundries will (a) provide "full service" business approach to their customers, and (b) desire to avoid disrupting weekly pick-up/ delivery routings, and not return free liquids to generators, but manage at the industrial laundry.
Other options	Exclude reusable wipes from RCRA Definition of Hazardous Waste, rather than from RCRA Definition of Solid Waste	Not applicable	Because conditions identical as main proposal, only "*catchet*" benefit from avoided stigma lost.

Direct Impact Element	Alternative Regulatory Option	Potential Economic Impacts of Regulatory Options	
		Disposable Wipes	Reusable Wipes

Explanatory Notes:

(a) * 5% applied to both the intra-company and offsite handler transfer assumption represents OSW's best judgement, in absence of data.

(b) ** $5,000 annual cost (year 2000$) per facility for RCRA employee training – source: USEPA Office of Solid Waste "Unit Cost Compendium", 30 Sept 2000, DPRA Incorporated, cost item 6, p.2).

(c) *** $300 social cost of paperwork burden per RCRA hazardous waste transport manifest (EPA Form 8700-22) consists of 38% cost to waste generators, 39%to waste transporters, 20% to waste receivers (i.e. waste treatment, storage disposal, recycling facilities), and 3% to state agencies (24 states distribute manifests, collect manifest information, and/or levy manifest fees); source: USEPA Office of Solid Waste, "Hazardous Waste Manifest Cost Benefit Analysis", Logistics Management Institute, Oct 2000, Table 3-9, page 3-7, http://www.epa.gov/epaoswer/hazwaste/gener/manifest/pdf/cba-rprt.pdf

II.F. Sensitivity Analysis

For purpose of quantifying the potential economic impacts of the proposed exclusions, this study assigned numerical values to different parameters representing current (baseline) regulatory conditions, as well as representing expected post-regulatory conditions (i.e. after the proposed exclusions are is promulgated as a final rule). The numerical values were based on different sources of data and information such as:

- USEPA Office of Solid Waste industrial survey findings
- Other Federal government databases
- Published commercial data sources (e.g. industrial supply catalogs)
- USEPA Office of Solid Waste best judgement based on fieldtrip observations, and meetings and telephone contacts with affected industry representatives.

The following table presents the numerical value **uncertainty ranges** assigned in this study to 20 impact estimation key parameters. Most of the parameters reflect uncertainty about baseline conditions, while a few others reflect different cost options for meeting the conditions of the regulatory exclusions. This set of parameters affects both estimation of direct and induced impacts in this study. In comparison to the key parameter settings as defined earlier in this study (i.e. most-likely values), the sensitivity analysis of this section re-estimates economic impacts (direct + induced), according to three alternative sets of parameter settings:

- "*Lower-bound*": Lowest estimate of number of entities directly impacted, as well as minimum unit values & quantities (note: for reusable wipes this scenario represents minimal direct impacts on industrial laundries, by assuming a 100% cost pass-thru of implementation costs, to industrial laundry wipes customers).

- "*Most-likely*": OSW's "best judgement" settings for key parameters (which do not necessarily represent the mid-point between the lower- and upper-bound).

- "*Upper-bound*": Highest estimate of number of entities impacted, as well as maximum unit values & quantities.

Assignment of Numerical Values to Key Baseline and Incremental Regulatory Impact Parameters For Sensitivity Analysis of Economic Impact Estimation (percentages relative to baseline)

Item	Direct Impact Element	Impact Estimation Baseline Parameter		Lower-Bound	Most-Likely	Upper-Bound
1	1. Wipes solvent eligibility	Percentage of wipes-using facilities which currently use RCRA solvents on industrial wipes (i.e. "generators")	Printers (3 of 13 subsectors)	90%	100%	100%
2			Non-printers (10 of 13 subsectors)	30%	35%	40%
3	2. Onsite wipes covered* accumulation containers	Percentage of spent RCRA solvent wipes not currently accumulated on-site in covered containers	Reusables	25%	50%	80%
4			Disposables			
5	3. Wipes transport containers	Percentage of spent RCRA solvent wipes not currently transported off-site in closed containers	Reusables	25%	50%	80%
6			Disposables			
7		Type of containers purchased for spent solvent wipes transport		Plastic bags	Average of two options	Metal drums

8	4. Wipes transport container labels	Percentage of RCRA solvent wipes transport containers currently without regulatory exclusion labels	Reusables	Not required in proposal		
9			Disposables	100%		
10	5. Wipes pre-transport preparation	Percentage of spent RCRA solvent wipes not "*dry*" as currently generated	Printers	90%	100%	100%
11			Non-printers	40%	50%	60%
12		Method for managing spent solvent "*free liquids*" recovered from spent wipes accumulation containers and from spent wipes transportation containers		Solvent recycling (net savings)	Average of two options	Fuel blending (net cost)
13	6. Intra-company transfer of wipes	Percentage of RCRA solvent spent wipes generators making intra-company transfers for "*free liquids*" removal	Reusables	0% (assume distribution controlled by laundries)		
			Disposables	5%		
14	7. Transfer to offsite handler	Percentage of RCRA solvent wipes generators making transfers to offsite handlers for "*free liquids*" removal	Reusables	0% (assume distribution controlled by laundries)		
15			Disposables	5%		
16	8. Offsite management of spent disposables arriving at waste mgt facilities & spent reusables at laundries	Percentage of RCRA solvent wipes containers that arrive at final destination with "*free liquids*"	Printers	1%	5%	10%
17			Non-printers	0.5%	2.5%	5%
18		Method for managing spent solvent "*free liquids*" recovered from spent wipes accumulation containers and from spent wipes transportation containers		Solvent recycling (net savings)	Average of two options	Fuel blending (net cost)

19	Other impact estimation parameters	"*Cross-price*" elasticity of demand as percentage of "*own-price*" elasticity magnitude (higher percentage simulates greater induced effect on relative price and marketshare between disposables & reusables; based on meta-analysis presented in this document)		11%	26%	26%
20		Percentage of states assumed to adopt voluntarily the exclusions after final rule promulgation		50%	75%	100%
21		Industrial laundry exclusion implementation cost pass-thru to reusable wipes customers	For laundry direct impact>	100%	32%	0%
			For simulating induced impact on wipes market>	0%		100%

Explanatory Notes:

(a) Sources for Numerical Values Assigned in This Table:

- Items 1 to 7: USEPA-OSW assigned numerical values for the three sensitivity analysis cases (i.e. lower, most-likely, and upper) based on either (a) field-trip research to wipes users or handlers, (b) from meetings or telephone contacts with representatives of affected industries, or (c) best judgement in absence of data.
- Other items:
  - Cross-price elasticity: Most-likely value based on meta-analysis of price elasticity data contained in other economic studies; identical upper-bound value assigned because reusable and disposable wipes are reportedly not interchangeable in some industrial applications; lower-bound based on two standard-deviations below the most-likely elasticity ratios derived from the meta-analysis.
  - State adoption: Percentages shown have two possible alternative economic modeling interpretations:
    - The percent of states/territories which may adopt the exclusions after promulgation by USEPA, or
    - The resultant percent of entities affected by the proposed rule, as a result of a different percent of states adopting the proposed exclusions.
  - Laundry cost pass-thru: Most-likely value from: USEPA Office of Water, "Economic Assessment for the Final Action Regarding Pretreatment Standards for the Industrial Laundries Point Source Category", EPA-821-R-00-004, March 2000, p.A-23 (http://www.epa.gov/ost/guide/laundry/final/economics.pdf).

(b) * Accumulating spent solvent industrial wipes in covered/closed containers on-site is an existing (baseline) "*best management practice*" in some industries. For example, the Printers' National Environmental Assistance Center (PNEAC) provides a pollution prevention checklist for use by lithographic printers, which specifies the use of closed containers for accumulating solvent industrial wipes, among other solvent and solvent wipes management tips (http://www.pneac.org/sheets/litho/p2_cklist_litho.html).

The result of applying the above uncertainty ranges for estimation of direct impacts for the proposed exclusions (main proposal) are:

Uncertainty Range for Estimate of Potential Average Annualized Direct Impact ($/year) on Spent Wipes Generators & Other Handlers (parentheses indicate net cost savings; other benefits categories not included in this table)**			
Uncertainty Range	($Millions/year)		
	Disposable Wipes	Reusable Wipes	Net Impact (row totals)
Lower-bound	($18.9) to ($20.5)	$2.9 to $4.6	($14.3) to ($17.6)
Most-likely	($32.5) to ($35.6)	$9.1 to $15.3	($17.2) to ($26.5)
Upper-bound	($47.9) to ($53.3)	$20.3 to $33.9	($14.0) to ($33.0)

II.G. Induced Market Impacts

In addition to direct impacts, this study also estimates potential "***induced impacts***" of the proposed exclusions, in the form of potential effects on the relative prices and national marketshare of reusable and disposable industrial wipes. This study simulates potential induced impacts by building upon the direct impacts estimated for each respective wipes category, and includes simulation of potential induced impacts on the industrial laundry sub-sector, which is also subject to some of the requirements of the proposed exclusions.

For simulating induced impacts, this study developed a simple **cobweb-type partial equilibrium market model**, which translates the estimated average annualized national direct impacts (i.e. implementation costs and cost savings), into a "per-wipe" unitized basis. The model then adds the unitized per-wipe direct impact to the current national average prices ($/wipe) for each respective wipe, for the purpose of simulating an implied post-regulatory "new price" (under both zero and full direct impact "***pass-thru***" assumptions). For this analysis, the wipes "price" includes both the direct cost to wipes users of purchasing (disposables) or leasing (reusables) industrial wipes, as well as the unitized per-wipe cost for managing spent wipes (i.e. the "***effective unit cost***" per wipe). The implied percentage changes in the relative prices (effective unit costs) to wipes users, provides a basis for the model to simulate potential shifts in marketshare between disposable and reusable wipes, to the extent that wipes users actually consider and are sensitive to relative prices (effective unit costs) in their purchasing choices between disposable and reusable industrial wipes.

The degree to which relative price (relative effective unit cost) is a factor in the selection between product substitutes, is referred to as the "***price elasticity of substitution***" for a product. The degree to which the demand for a particular product is influenced by the price of that same product is referred to as the "***own-price elasticity***". The degree to which the demand for a particular product is influenced by the price of a substitute product is the "***cross-price elasticity***". This document derived both an "own" and "cross" price elasticity for simulation of the potential composite effect of changes to both reusable and disposable wipes effective cost, in estimating potential induced market impacts. Own-price elasticity was derived from actual US historical data on national average price and quantities sold for reusable wipes, whereas in absence of historical data for the US disposable wipes market, this study derived an estimate of cross-price elasticity based on **meta-analysis** of cross-elasticity data published in other economic studies.

A series of spreadsheets which follow in this document present the findings for both the direct and induced impact categories, including supporting data tables and computation spreadsheets for some of the key parameters applied in this document.

Simulated Induced Impact on Relative Unit Cost of Industrial Wipes in the US (based on the potentially affected sub-market of 2.8 billion solvent industrial wipes/year)

Type of Industrial Wipe >	Reusables (laundry cost pass-thru assumptions)			Disposables		
	Lower-bound (0%)	Most-likely (32%)	Upper-bound (100%)	Lower-bound	Most-likely	Upper-bound
Current (baseline) average unit cost	$0.0535			$0.2368		
Post- final rule estimated average unit cost	$0.0535	$0.0565	$0.0627	$0.0961	$0.1020	$0.1096
Estimated percentage change in unit cost	0%	5.6%	17.2%	(59%)	(56%)	(53%)

Simulated Induced Impact on Industrial Wipes US National Marketshare (based on the potentially affected sub-market of solvent industrial wipes)									
Type of Industrial Wipe>	Reusables			Disposables			Row totals		
	Lower-bound	Most-likely	Upper-bound	Lower-bound	Most-likely	Upper-bound	Lower-bound	Most-likely	Upper-bound
Current (baseline) marketshare									
Annual solvent wipes uses affected by exclusions	1.49 billion	2.55 billion	3.68 billion	0.15 billion	0.26 billion	0.39 billion	1.64 billion	2.81 billion	4.07 billion
Relative marketshare	91%			9%			100%		
Possible induced market impact									
Change in annual wipes uses	(48 million)	(218 million)	(574 million)	48 million	218 million	218 million	0		
Percentage change	(3.2%)	(8.5%)	(15.6%)	32%	88%	148%	0%		
Possible marketshare after final rule implementation									
Annual wipes uses	1.44 billion	2.33 billion	3.11 billion	0.20 billion	0.48 billion	0.96 billion	1.64 billion	2.81 billion	4.07 billion
Relative marketshare	88%	83%	76%	12%	17%	24%	100%		

II.H. Small Business Impacts

! Small businesses: Because of the fact that 96% of companies which use industrial wipes across the 13 sub-sectors, as well as 94% of industrial laundry companies are small businesses (i.e. "companies" or "firms"), this study assessed the potential magnitude of impacts on small businesses.

! Small facilities: Establishments (i.e. facilities) owned and operated by small businesses are:
- ! 94% small facilities in 13 generator sub-sectors
- ! 47% small facilities in industrial laundry industry

Baseline Count of Facilities Owned & Operated by Small Businesses									
Facility size	Spent Wipes Generators (13 sub-sectors)			Industrial Laundries			Both Sub-Groups Combined		
	Lower-bound	Most-likely	Upper-bound	Lower-bound	Most-likely	Upper-bound	Lower-bound	Most-likely	Upper-bound
All sizes	62,400	106,100	151,800	588	881	1,175	63,000	107,000	153,000
Small only	53,700	92,700	131,400	275	414	551	54,000	93,000	132,000

! Based on the zero-impact findings summarized in the table below for the "most likely" case, as well as the relatively small percentage of small businesses potentially affected above the 3% threshold level, OSW presumes that the proposed RCRA regulatory exclusions are eligible for a "No-SISNOSE" (i.e. no significant impact on a substantial number of small entities) determination for Regulatory Flexibility Act (RFA) certification.

Screening Analysis Findings for Regulatory Flexibility Act Small Business Impact Certification (Direct Compliance Costs + Induced Market Effects)

USEPA's March 1999 RFA Guidance* thresholds	Potentiall affected sub-group	Estimated count of small facilities potentially exceeding thresholds			% of small facilities in associated sub-group exceeding thresholds			% of all small facilities potentially affected		
		Lower-bound	Most-likely	Upper-bound	Lower-bound	Most-likely	Upper-bound	Lower-bound	Most-likely	Upper-bound
>1% of revenues	Industrial laundries	0	0	72	0%	0%	13.1%	0%	0%	0.054%
	Wipes generators	0	0	0	0%	0%	0%			
>3% of revenues	Industrial laundries	0	0	16	0%	0%	2.9%	0%	0%	0.012%
	Wipes generators	0	0	0	0%	0%	0%			

Explanatory Notes:

(a) The estimated number of entities (wipes generators & wipes handlers) potentially affected by the proposed exclusions is subject to three ***sensitivity analysis*** factors, combinations of which produce these three baseline uncertainty cases:

(a) Percentage of states which may adopt the final rule

(b) Percentage of wipes-using printer entities which apply RCRA solvents to industrial wipes

(c) Percentage of wipes-using non-printer entities which apply RCRA solvents to industrial wipes

(b) *USEPA's 29 March 1999 Regulatory Flexibility Act (RFA) Guidance (100 pages) is available at http://www.epa.gov/sbrefa/documents/iguid99.pdf

II.I. Other Factors Potentially Affecting Economic Impacts

! Wipes Limited Substitutability

In addition to wipes price (unit cost) differences, there are at least three qualitative differences between disposables and reusables, which suggest that wipes relative marketshare and product switching (substitution), are not solely a function of wipes relative price:

Factors Influencing Market Substitutability Between Reusable & Disposable Wipes	
Factor	Definition
Wipes performance:	Wipes (a) lint residue, (b) absorbency, and (c) durability, dictate consumer choice in wipes for many industrial applications where these qualities are critical (e.g. electronic manufacturing cannot tolerate lint).
Wipes market supply:	Industrial laundries provide reusable wipes users with the benefit of full "cradle-to-grave" service, thereby avoiding need to manage wipes; in contrast, users of disposable wipes must manage their spent wipes as waste. Furthermore, contracts with industrial laundries are often multi-year, which serve to "lock-in" customers.
Small portion of industry operating costs:	Compared to total operating costs (equipment + energy + materials + labor), annual baseline costs to a business of using industrial wipes is very small, averaging 0.08% of operating cost (sub-sector averages range from 0.01% to 3.47% across the 13 sub-sectors). Consequently, changes in the relative price of disposable and reusable wipes may go unnoticed by wipes users (i.e. "price-inelastic demand").

! Annual Solvent Quantities Purchased for Industrial Wipes:

Possible induced decrease in future annual growth of US demand for newly-produced solvents applied in industrial wipes operations, as a consequence of induced increase in the annual quantity of solvents recovered from solvent-contaminated wipes to meet the proposed "*no free liquids*" regulatory exclusion condition. Recovered solvents may be reused on wipes, thereby reducing demand for newly-produced solvents.

! Solvent Types Purchased for Industrial Wipes:

Possible induced change in the proportional mix of US annual demand for solvents applied in industrial wipes operations, as a consequence of induced decrease in demand for certain types of solvents which may no longer be landfilled, and an induced compensating increase in demand for solvents not restricted from landfills. This study estimates the potential induced shift in national marketshare between the two types of industrial wipes, but not in the chemical types of solvents applied to wipes.

Analysis of 1999 price data (standardized to $/gallon) for 43 different industrial cleaning/degreasing solvents used in the US economy (compiled from the Stanford Research Institute "*Chemical Economics Handbook*", http://ceh.sric.sri.com), reveals that the $3.17/gallon average cost of 27 RCRA F-listed solvents, is 4% less expensive than the $3.30/gallon average cost of 16 non-F-listed solvents. This difference presents a slight purchase price advantage for F-listed solvent users, but users of F-listed solvents would also incur a relatively higher life-cycle cost of using F-listed solvents because of RCRA hazardous waste management requirements.

Consequently, comparison of average prices does not suggest an overall cost advantage which would induced current users to switch from non-F to F-listed solvents. However, at the minimum-end of the price range for each solvent grouping, the $0.75/gallon minimum price for F-listed solvents, is 48% less expensive compared to the $1.44/gallon minimum price for non-F-listed solvents, which suggests there may be a clear cost advantage (incentive) for some current users of non-F-listed solvents to switch-over to using F-listed solvents, as a result of the exclusion of disposable wipes from hazardous waste regulation.

At the maximum-end of the respective price ranges, the group of 27 F-listed solvents has a maximum price of $6.19/gallon, which is 15% higher than the $5.38/gallon maximum price for the group of 16 non-F-listed solvents. Given that some users currently pay higher-prices for F-listed solvents suggests that F-solvents may offer preferred chemical performance characteristics in some industrial solvent applications. If this is the case, it is conceivable that some non-F-listed solvent users may be induced to switch to using higher-priced F-listed solvents to enhance industrial performance characteristics, as a result of the exclusion possibly lowering the life-cycle cost of using F-listed solvents.

In absence of detailed and comprehensive marketshare data on these two groups of industrial cleaning/ degreasing solvents, OSW modeled this potential comparative price switch-over, by the following mathematical device: by estimating the respective marketshare areas represented by overlaying a normal (bell-shaped) distribution curve over the solvent price range data, and then computing statistical z-scores (standard normal random variable[6]) to represent the area under the distribution curve, according to a normal distribution statistical probability table (note that the distribution is not perfectly normal-shaped, as the skewness is 0.17 (normal = 0), and the kurtosis is -1.00 (normal =0), based on the price data analysis presented in an earlier spreadsheet in this document).

The range between the minimum and maximum (i.e. lower-tail and upper-tail) across the price distribution for all 43 solvent prices combined, is compared to the respective tail areas for a normal distribution fit to the F-listed solvent price range. For purpose of developing an estimate in this study, it is assumed that the tail areas of the overall price distribution after promulgation of the final rule, will be identical to the tail area proportions under the F-listed solvent price range distribution curve.

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[6] The statistical "*z-score*" is defined in most university-level statistics textbooks (e.g. James McClave & P.George Benson, Statistics for Business and Economics, (Section 6.3: The Normal Distribution), 4th edition, Dellen/MacMillan Publishers, 1988).

Estimation of Potential Switch in National Solvent Usage After Promulgation of RCRA Exclusions		
! Respective min/max price distribution tail areas for the combined sample of **43 solvents**:		
Price distribution characteristics: mean = $3.22; standard deviation = $1.34		
Price distribution (range)	Z-score computation	Distribution area
Lower-tail area	($1.44-$3.22)/$1.34 = -1.33	9%
Upper-tail area	($5.38-$3.22)/$1.34 = 1.61	5%
	Total =	15%
! Respective min/max price distribution tail areas for the sample of **26 F-listed solvents**:		
Price distribution characteristics: mean = $3.17; standard deviation = $1.38		
Price distribution (range)	Z-score computation	Distribution area
Lower-tail area	($1.44-$3.17)/$1.38 = - 1.25	11%
Upper-tail area	($5.38-$3.17)/$1.38 = 1.60	5%
	Total =	16%
Possible percentage of non-F-listed solvents switching to F-listed solvents = (1-35%) x 16% = 10%		

From the above computations, according to an assumed normal distribution across solvent prices, the minimum-end price tail between the $0.75/gallon F-listed minimum price, and the $1.44/gallon non-F-solvent minimum price, represents 9% of the solvent price distribution. The upper-end tail of this distribution between the maximum $5.38/gallon non-F-listed solvent price and the $6.19/gallon F-listed solvent price, represents 5% (totaling 14% for both tails of the distribution). By computing statistical probability z-scores to represent these distribution tail areas, and then proportioning the new respective tail areas in proportion to the F-listed group of 27 solvents (totaling 16% for both tails), provides an estimate that 10% of non-F-listed solvent users, may switch to using F-listed solvents.

In addition to solvent purchase price and solvent usage life-cycle cost considerations, there are environmental considerations that facilities may consider, so the 10% switch-over should be considered as an "*upper-bound*" estimate. For example, some facilities may want to minimize the use of F-listed solvents that contain hazardous air pollutants (HAPs) to meet any air permitting requirements they may have. Based on the same list of 43 industrial solvents, 27 are F-listed (63%), and 16 of the 27 F-listed solvents (59%) are HAPs, so there a number of F-listed candidate solvents (at least 11) that would not present a HAP concern, under the year 2001 USEPA HAP list.

! Future Annual Generation of Solvent-Contaminated Industrial Wipes

Industrial production — and hence, industrial demand — for wipes has grown an average of 3.05% annually in the US economy for the last 15 years (1986-2000 data trend). This average annual growth represents the overall rate of growth in industrial production over the 13 economic sub-sectors which are known to use industrial wipes, including both "printer" (n= 3) and "non-printer" (n= 10) sub-sectors. This factor could be applied in both the economics and risk assessment as a sensitivity analysis of impacts and risk estimates, respectively, according to a future "***period-of-analysis***" (i.e. stream of future years), by applying the multiplier [(1+0.0305)^n], where n = number of future years. The following two tables display the projected future quantity of affected industrial wipes, and the projected future annualized economic impact of the exclusions, respectively, with this annual industrial growth factor applied for 30-years.

Projected Growth in Future Generation of Solvent-Contaminated Spent Industrial Wipes (Disposable + Reusable Wipes Generated by SQGs & LQGs)

	RCRA Solvent Industrial Wipes Affected by Exclusions (billions/year)		
Uncertainty Range	2001 Baseline*	10-years (factor 1.35)	30-years (factor 2.46)
Lower-bound	1.6	2.2	3.9
Most-likely	2.8	3.8	6.9
Upper-bound	4.1	5.5	10.1

* Note: This key parameter (i.e. estimated number of solvent-contaminated industrial wipes generated per year) is subject to three ***sensitivity analysis*** factors, combinations of which produce these three baseline uncertainty cases:

- ! Percentage of states which may adopt the exclusions after promulgation as a final rulemaking
- ! Percentage of wipes-using printer entities which apply RCRA solvents to industrial wipes.
- ! Percentage of wipes-using non-printer entities which apply RCRA solvents to industrial wipes.

Projection of Future Annualized Impacts Over 30-Years
Based on 15-Year Historical Growth in Industrial Production Index (1986-2000)

		Maximum Net Savings (lowest costs + highest savings)			Maximum Net Cost (highest costs + lowest savings)		
IPI Annual Growth		3.05%	3.05%	3.05%	3.05%	3.05%	3.05%
Item	Year	Disposables	Reusables	Combined	Disposables	Reusables	Combined
1	2004	($35,630,000)	$9,150,000	($26,480,000)	($32,480,000)	$15,280,000	($17,200,000)
2	2005	($36,717,738)	$9,429,338	($27,288,400)	($33,471,573)	$15,746,479	($17,725,094)
3	2006	($37,838,683)	$9,717,203	($28,121,480)	($34,493,417)	$16,227,198	($18,266,218)
4	2007	($38,993,849)	$10,013,857	($28,979,992)	($35,546,456)	$16,722,594	($18,823,862)
5	2008	($40,184,281)	$10,319,567	($29,864,714)	($36,631,644)	$17,233,113	($19,398,530)
6	2009	($41,411,056)	$10,634,610	($30,776,446)	($37,749,960)	$17,759,218	($19,990,743)
7	2010	($42,675,282)	$10,959,271	($31,716,011)	($38,902,418)	$18,301,384	($20,601,034)
8	2011	($43,978,103)	$11,293,844	($32,684,260)	($40,090,059)	$18,860,102	($21,229,957)
9	2012	($45,320,698)	$11,638,630	($33,682,068)	($41,313,957)	$19,435,876	($21,878,080)
10	2013	($46,704,281)	$11,993,942	($34,710,338)	($42,575,218)	$20,029,228	($22,545,990)
11	2014	($48,130,102)	$12,360,102	($35,770,000)	($43,874,985)	$20,640,695	($23,234,290)
12	2015	($49,599,452)	$12,737,440	($36,862,012)	($45,214,432)	$21,270,829	($23,943,603)
13	2016	($51,113,659)	$13,126,298	($37,987,362)	($46,594,770)	$21,920,200	($24,674,570)
14	2017	($52,674,093)	$13,527,027	($39,147,067)	($48,017,248)	$22,589,395	($25,427,853)
15	2018	($54,282,166)	$13,939,989	($40,342,176)	($49,483,153)	$23,279,020	($26,204,133)
16	2019	($55,939,330)	$14,365,559	($41,573,771)	($50,993,810)	$23,989,699	($27,004,111)
17	2020	($57,647,086)	$14,804,121	($42,842,965)	($52,550,585)	$24,722,073	($27,828,512)
18	2021	($59,406,977)	$15,256,072	($44,150,905)	($54,154,887)	$25,476,806	($28,678,080)
19	2022	($61,220,595)	$15,721,820	($45,498,775)	($55,808,166)	$26,254,580	($29,553,585)
20	2023	($63,089,581)	$16,201,787	($46,887,794)	($57,511,917)	$27,056,099	($30,455,818)
21	2024	($65,015,625)	$16,696,407	($48,319,218)	($59,267,682)	$27,882,087	($31,385,595)
22	2025	($67,000,468)	$17,206,126	($49,794,342)	($61,077,048)	$28,733,291	($32,343,757)
23	2026	($69,045,906)	$17,731,407	($51,314,499)	($62,941,651)	$29,610,481	($33,331,170)
24	2027	($71,153,789)	$18,272,724	($52,881,064)	($64,863,179)	$30,514,451	($34,348,728)
25	2028	($73,326,022)	$18,830,567	($54,495,455)	($66,843,368)	$31,446,018	($35,397,350)
26	2029	($75,564,571)	$19,405,440	($56,159,131)	($68,884,010)	$32,406,024	($36,477,985)
27	2030	($77,871,460)	$19,997,863	($57,873,597)	($70,986,950)	$33,395,338	($37,591,611)
28	2031	($80,248,775)	$20,608,372	($59,640,403)	($73,154,090)	$34,414,855	($38,739,235)
29	2032	($82,698,667)	$21,237,519	($61,461,148)	($75,387,390)	$35,465,496	($39,921,894)
30	2033	($85,223,351)	$21,885,873	($63,337,478)	($77,688,870)	$36,548,212	($41,140,658)
Summary:							
Column totals =		($1,709,700,000)	$439,100,000	($1,270,600,000)	($1,558,600,000)	$733,200,000	($825,300,000)
NPV =		($653,110,000)	$167,720,000	($485,390,000)	($595,370,000)	$280,090,000	($315,280,000)
AAE =		($49,189,000)	$12,632,000	($36,557,000)	($44,840,000)	$21,095,000	($23,745,000)

Note: Percent annual growth based on the Industrial Production Index (US Federal Reserve data); average annual percentage growth in the IPI over the 15-year historical period 1986-2000 for 13 sub-sector spent wipes generators (http://www.federalreserve.gov/releases/G17/table1_2.htm).

! Solvent Recycling

! Recycling Assumptions Applied in this Study

One source of uncertainty, among others, in this economic impact study, is how facilities currently manage spent solvent "*free liquids*" which may appear in on-site spent wipes accumulation container, and/or appear in spent wipes transport containers, and how facilities may decide to manage any incremental increase in "*free liquids*" captured as a result of complying with the conditions of the exclusions. This study estimated the economic impact for two possible "*free liquids*" management options:

- **!** Fuel blending: Shipping solvent "*free liquids*" to offsite hazardous waste fuel blenders (at an average net cost of $0.91 per gallon, based on average unit cost reported for hazardous waste fuel blending from the OSW Sept 2000 "Unit Cost Compendium").
- **!** Recycling: Recycling solvent "*free liquids*" for reuse as solvents (at an average net cost savings of $0.74 per gallon, based on the $2.54 average unit cost from the three data points below, minus the $3.28 average price of virgin solvent avoided cost from solvent price data in an attachment to this document).

The solvent recycling option in this study represents an average unit cost for two recycling scenarios:

- **!** Onsite: $1.00/gallon unit cost reported for an onsite solvent recycling operation in the printing industry[7]
- **!** Offsite: $2.45 to $4.16/gallon unit cost for offsite commercial solvent recycling[8]

This study does not estimate the proportion of industrial wipes users which currently fuel blend, or which currently recycle onsite or offsite, or which may find solvent recycling economically attractive if compliance with the conditions of the exclusions result in an incremental increase in the quantity of "*free liquids*" captured onsite by the spent wipes generator. Furthermore, this study does not estimate the proportion of facilities which currently, or may be induced by compliance with the exclusions, to operate onsite, or ship spent solvent wipes offsite to, a solvent extraction device (e.g. centrifuge machine) to capture solvents from spent wipes as allowed by the RCRA regulatory exclusions (although a following section presents a sample of equipment cost data for solvent wipes centrifugation). Adoption of either onsite or offsite spent wipes centrifugation (and other solvent extraction techniques) may incrementally increase the annual quantity of solvent to be managed in fuel blending or recycling processes.

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[7] $1.00/gallon onsite recycling unit cost based on a case study for the printing industry: http://www.rapidimaging.com/TSR/TSR%20R-07%20Platemaking%20Productivity%20for%20Web.pdf

[8] $2.45/gallon offsite commercial hazardous waste solvent recycling cost based on a case study on parts washing in the metal manufacturing industry (http://www.iwrc.org/pubs/IPPIMetal.pdf); $4.65/gallon offsite hazardous waste solvent recycler based on a case study of solvent cleaning of industrial painting equipment in the plastics manufacturing industry (http://www.eponline.com; 13 April 2003).

! Quantity of Solvents Applied to Industrial Wipes

The amount of solvents applied annually in the US to industrial wipes is a relatively large absolute quantity. A supplemental data attachment to this document contains annual national data on solvent production and consumption. Based on published estimates from 1991 and 1997, respectively, the US produced at least 27.0 million tons per year (about 6.93 billion gallons) of 43 different chemicals used as solvents, and consumed at least 6.33 million tons (about 1.62 billion gallons) of these solvent chemicals in actual solvent applications, (i.e. excluding use of solvent chemicals as chemical manufacturing feedstocks).

As displayed in the table below, at least 0.90 million tons per year (about 231 million gallons) of at least 23 different chemicals are reportedly used as solvents in cleaning/degreasing applications, of which OSW estimates that 82,000 to 103,000 tons per year (about **21 to 26 million gallons**) are applied to industrial wipes. This estimate of solvent application to industrial wipes represents about 11% to 14% of the consumption of cleaning/degreasing solvents, and represents 1.3% to 1.6% of all solvent applications (excluding solvents used as chemical feedstocks). The 23 chemicals reportedly used as cleaning/degreasing solvents represent nine different chemical classes: (1) alcohols, (2) aliphatic hydrocarbons, (3) aromatic hydrocarbons, (4) chlorinated aliphatic hydrocarbons, (5) chlorinated aromatic hydrocarbons, (6) esters, (7) ketones, (8) glycols, and (9) ethers.

Annual Quantity of Solvents Applied to Industrial Wipes Compared to the Industrial Solvent Universe

Solvent subset		Annual Solvent Quantity (equivalency metrics)		Relative percent
		Million tons/year	Million gallons/year	
Universe: Manufacture of 43 industrial chemicals which may be used as solvents* (other chemicals may also be used but not as prevalent)		27.0	6,930	
Subset 1: All industrial solvent applications*		6.3	1,620	100%
Subset 2: Only industrial solvent cleaning/degreasing applications*		0.9	231	14%
Subset 3: Only solvents applied to industrial wipes (for cleaning/ degreasing)	Reusable wipes**	0.072 to 0.091	18.6 to 23.3	1.3% to 1.6%
	Disposable wipes***	0.010 to 0.012	2.5 to 3.2	
	Subtotal wipes	0.082 to 0.103	21.1 to 26.5	

Explanatory Notes:

(a) * Source: See supplementary attachment with industrial solvent data at end of this document.

(b) ** Source: Based on USEPA Office of Water survey data on 1994 annual quantity of reusable wipes processed by US industrial laundries (Tables 4-2 and 4-3 in report EPA-821-R-00-006, March 2000, http://www.epa.gov/waterscience/guide/laundry/final/section1.pdf):

- Non-printer reusables: Wipes: (9.360 billion lbss/year total items laundered) x (3.7% non-printer reusables) = 346.3 million lbs/year wipes
  Solvent: [(346.3 million lbs/year wipes) x (12.5% solvent weight)]/(60% to 75% non-evaporation****)
  = 57.7 to 72.2 million lbs/year = 28,800 to 36,100 tons/year = 7.4 to 9.3 million gallons/year solvents
- Printer reusables: Wipes: (9.360 billion lbs/year total items laundered) x (1.4% printer reusables) = 131.0 million lbs/year wipes
  Solvent: [(131.0 million lbs/year wipes) x (50% solvent weight)]/(60% to 75% non-evaporation****)
  = 87.4 to 109.2 million lbs/year = 43,700 to 54,600 tons/year = 11.2 to 14.0 million gallons/year solvents
- Total reusables: Wipes: 477.3 million lbs/year wipes= 0.239 million tons/year wipes
  Solvents: 145.1 to 181.4 million lbs/year =72,000 to 91,000 tons/year = 18.6 to 23.3 million gallons/year solvents

(c) *** Source: Disposable wipes solvents estimated as proportionate to US national marketshare of 12% disposables:to:88% reusables.

(d) **** Source: Possible 25% to 40% solvent evaporation loses reported from non-covered containers with solvents in the automobile service industry, by the Alabama Dept of Environmental Management Pollution Prevention Unit, and by the Virginia Office of Small Business Assistance (http://www.deq.state.va.us/osba/factsheets/autoserv.html); this evaporation loss range is applied in this table as a generic (average) for all solvent wipes applications.

! Economic Feasibility of Solvent Recycling

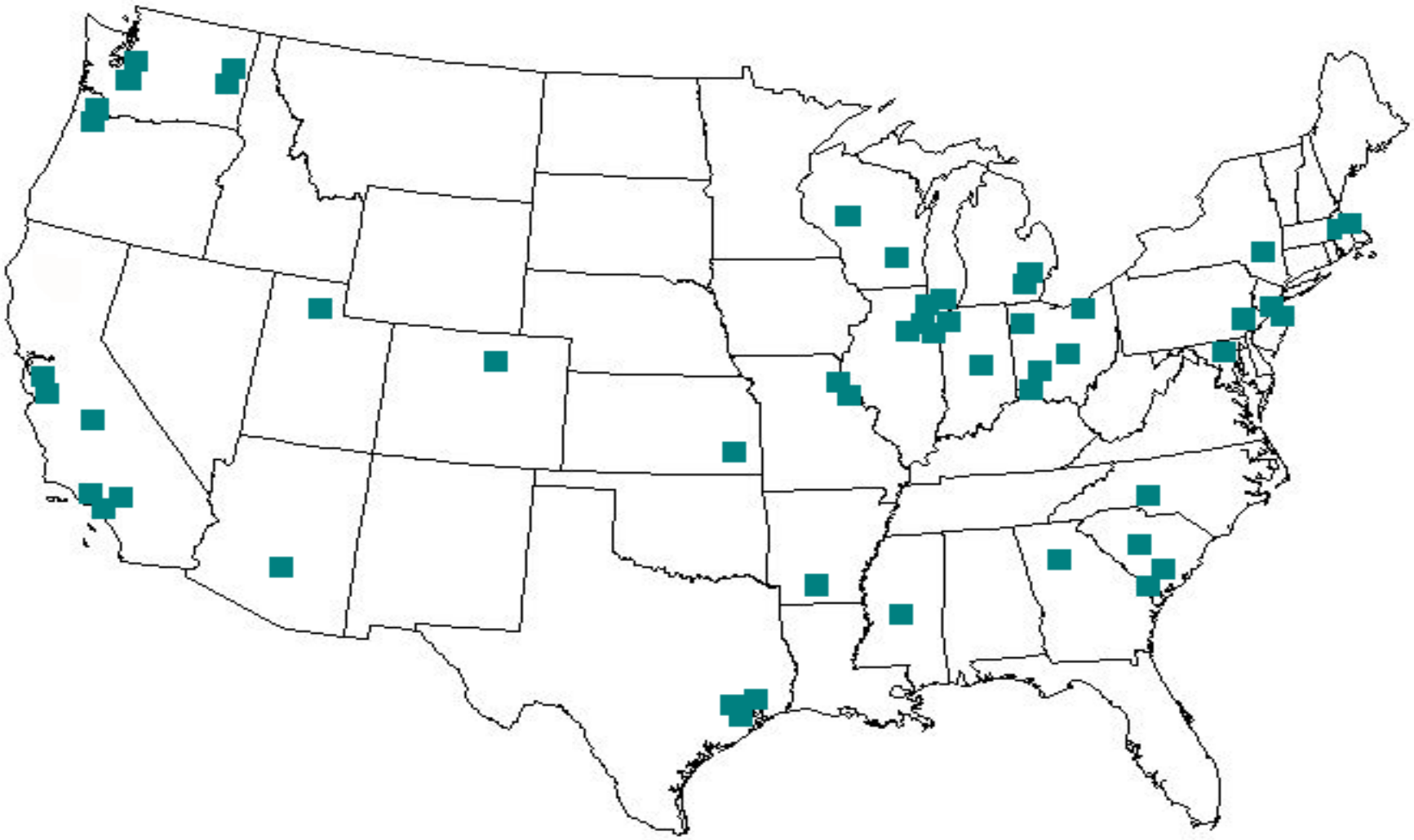
There are many economic factors – both macro and micro – which determine the economic feasibility of spent solvent recycling for any individual facility. Because many chemicals used as solvents are derived from petroleum, their prices fluctuate according to the price of crude oil. Consequently, the potential value (economic feasibility) of recycling spent solvents, as opposed to buying virgin solvents and disposing of spent solvents by blending for use as fuel, also fluctuates with the price of oil (http://www.envirobiz.com/news/011901_11.htm). High crude oil prices might increase spent solvent generators' incentives to recover solvents, rather than blend them for use as fuels. Micro-economic factors include transportation access to offsite recycling facilities or via mobile recycling unit, recycled solvent quality, and minimum purity specifications (higher quality specifications require higher processing costs), addition of acid inhibitors or metal stabilizers, batch size of recycling operations (increasing batch size lowers unit costs for recycling), still bottom disposal, and resale value of the recycled solvent.[9] The map below displays the location of 51 commercial spent solvent hazardous waste recycling facilities identified in the "*2003 Directory of US Commercial Recycling Facilities*" (Hazardous Waste Consultant, Vol.21, Nr.3, Aspen Publishers Inc.).

[9] These micro-economic factors are described in "Fact Sheet: Considerations in Selecting a Commercial (Off-Site) Solvent Recycling Service", Michigan Dept of Environmental Quality, Environmental Assistance Division Publication #9204, Dec 1998, http://www.deq.state.mi.us/documents/deq-ead-recycle-solrecyc.pdf.

Two other references about the micro-economics of solvent recycling provide facility-level benefit/cost worksheets to compute economic feasibility (profitability) of solvent recycling:

- "A Guide for Choosing and Operating an On-Site Distillation Unit", Washington State Dept of Ecology Publication #94-31, 31 Oct 1995, http://es.epa.gov/techninfo/facts/washington/wsde3.html.
- Iowa Pollution Prevention Initiative, Small Business Development Center, Iowa Waste Reduction Center,"Pollution Prevention Implementation Plan for Metal Manufacturers", see Section 3: Painting Equipment Cleaning; and Section 4: Parts Washing, http://www.iwrc.org/pubs/IPPIMetal.pdf

Location of 51 Hazardous Waste Spent Solvent Recyclers
(Source: 2003 Directory of US Commercial Hazardous Waste Recycling Facilities,
Hazardous Waste Consultant journal, vol. 21, nr. 3, 2003, Aspen Publishers Inc.)



! Solvent Extraction (Centrifugation)

The following tables and graphs (below and next three pages) present (a) wipes centrifuge capital and O&M cost data, (b) wipes centrifuge and solvent recycling net costs (reflecting hypothetical cost offset for reuse value of recycled solvents), and (c) break-even curve to illustrate the solvent reuse values required to achieve cost break-even, based on a sample of five wipes centrifuge machine sizes (i.e. five alternative annual wipes processing capacities).

Wipes Centrifuge & Recovered Solvent Management Costs
For Processing Solvent-Contaminated Industrial Wipes

Facility Size*					1999 Reference Cost Data:*				2001$ Cost Update:****		
										Implied Average Cost/Wipe:	
Facility size classes	%	Centrifuge Wipes Capacity: Base capacity (lbs/year)	Reusables (wipes/year)**	Disposables (wipes/year)**	Centrifuge capital cost (initial year)	Annualized*** equivalent cap.cost ($/year)	Centrifuge O&M cost ($/year)	Total annualized cost ($/year)	Total annualized cost ($/year)	Reusables ($/wipe)	Disposables ($/wipe)
1	20%	8,800	70,400	162,800	$37,076	$4,250	$9,435	$13,685	$13,839	$0.1966	$0.0850
2	50%	130,000	1,040,000	2,405,000	$40,034	$4,589	$25,721	$30,310	$30,652	$0.0295	$0.0127
3	84%	650,000	5,200,000	12,025,000	$73,517	$8,427	$49,032	$57,459	$58,107	$0.0112	$0.0048
4	95%	1,794,000	14,352,000	33,189,000	$154,130	$17,666	$128,477	$146,143	$147,793	$0.0103	$0.0045
5	99%	3,500,000	28,000,000	64,750,000	$297,043	$34,047	$249,216	$283,263	$286,460	$0.0102	$0.0044

Explanatory Notes:

(a) * 1999 cost data source: Eastern Research Group, Inc., 04 April 2000 memorandum to USEPA-EAD (George Denning), "Revised Draft Documentation for Operating and Installing a Centrifuge at Industrial Laundries", 3 pages + 17 calculation sheets. Facility size categories (i.e. centrifuge annual processing capacity categories) established based on USEPA Office of Water sample of 145 industrial wipes laundries.

(b) The above cost estimates exclude/include the following costs associated with RCRA Subtitle C hazardous waste solvent management requirements:

– Exclude costs associated with RCRA Subtitle C permitting, which is not required for solvent extraction processes in OSW's proposed solvent wipes rule.

-- Include costs for solvent storage tanks, tank secondary containment, & RCRA hazardous waste manifest transport of solvent to offsite reclaimers (e.g. recyclers).

-- Include RCRA administrative costs to generating facility ($1,800 per facility).

(c) ** Nr. annual wipes estimated by multiplying annual pounds, times average lbs per solvent-contaminated wipe:

	Reusable wipes	Disposable wipes	
– Average weight of wet solvent-contaminated industrial wipe (lbs/wipe) =	0.1250	0.0541	100%
– Average weight of dry industrial wipe (lbs/wipe) =	0.0750	0.0324	60%
– Average weight of solvent contained-in a contaminated industrial wipe (lbs/wipe) =	0.0500	0.0216	40%

(d) *** Cost annualization factors:

Discount rate = 7.0% Centrifuge equipment lifespan = 12.5 years

(e) **** Cost update multiplier (http://www.che.com):

1999 Chem.Eng. Plant Cost Index (reference cost data source) = 389.9 2001 Chem.Eng. Plant Cost Index = 394.3 Cost update multiplier (2001/1999) = 1.011

Net Cost for Wipes Centrifuging & Solvent Recycling
For Processing Solvent-Contaminated Industrial Wipes

Reference facility size categories	Facility size percentile	Annual Quantity Wipes Solvent Recovered (lbs/year)*	Annual Quantity Wipes Solvent Recovered (gals/year)*	Solvent Recovery Costs: A Annualized centrifuge cost ($/year)	Solvent Recovery Costs: B Solvent recycling cost ($/year)	Solvent Recovery Costs: C (A+B) Centrifuge + recycling cost ($/gallon)	Net Cost (2001$): D Reuse value** recycled solvent ($/year)	Net Cost (2001$): E (C+D) Net cost ($/year)	Average Net Cost Per Wipe: Reusables ($/wipe)	Average Net Cost Per Wipe: Disposables ($/wipe)	Average net cost per gallon	Solvent reuse value needed for break-even
1	20%	2,746	352	$13,839	$893	$41.85	($1,153)	$13,579	$0.1929	$0.0834	$38.58	$41.85
2	50%	40,560	5,200	$30,652	$13,191	$8.43	($17,035)	$26,807	$0.0258	$0.0111	$5.16	$8.43
3	84%	202,800	26,000	$58,107	$65,953	$4.77	($85,176)	$38,884	$0.0075	$0.0032	$1.50	$4.77
4	95%	559,728	71,760	$147,793	$182,031	$4.60	($235,086)	$94,738	$0.0066	$0.0029	$1.32	$4.60
5	99%	1,092,000	140,000	$286,460	$355,133	$4.58	($458,640)	$182,953	$0.0065	$0.0028	$1.31	$4.58

Explanatory Notes:

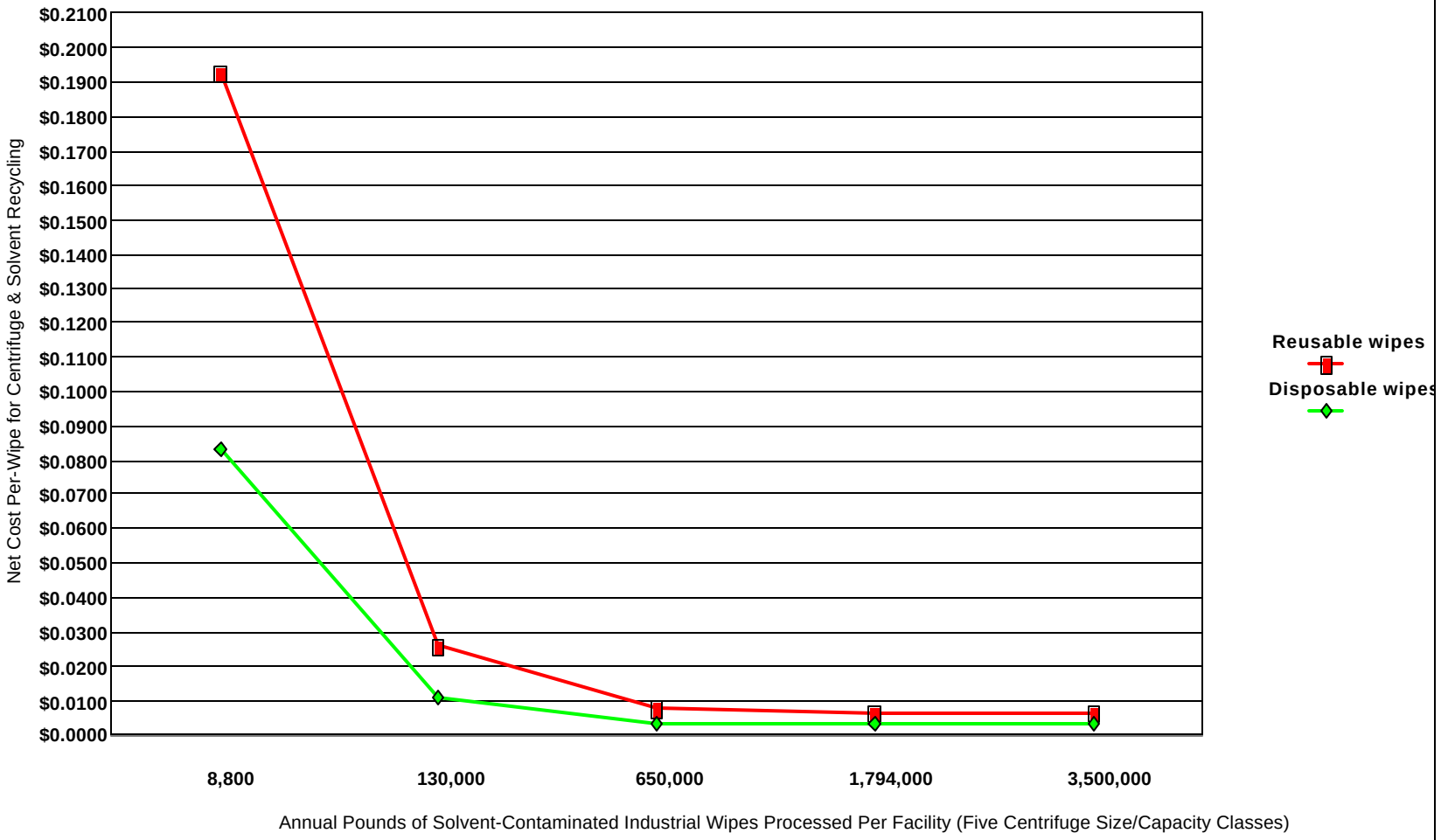
(a) *Quantity solvent recovered independent of wipes type under full capacity loading, given assumption that both types contain average 40% solvent by weight.
Solvent recovered estimated by multiplying annual wipes processed, by recovery efficiency, and by average lbs solvent per contaminated wipe:

Average weight of wet solvent-contaminated reusable industrial wipe (lbs/wipe) =	0.1250	100%
Average weight of dry reusable industrial wipe (lbs/wipe) =	0.0750	60%
Average weight of solvent contained-in a contaminated reusable industrial wipe (lbs/wipe) =	0.0500	40%
Average weight of wet solvent-contaminated disposable industrial wipe (lbs/wipe) =	0.0541	100%
Average weight of dry disposable industrial wipe (lbs/wipe) =	0.0324	60%
Average weight of solvent contained-in a contaminated disposable industrial wipe (lbs/wipe) =	0.0216	40%

(b) ** Other assumptions:

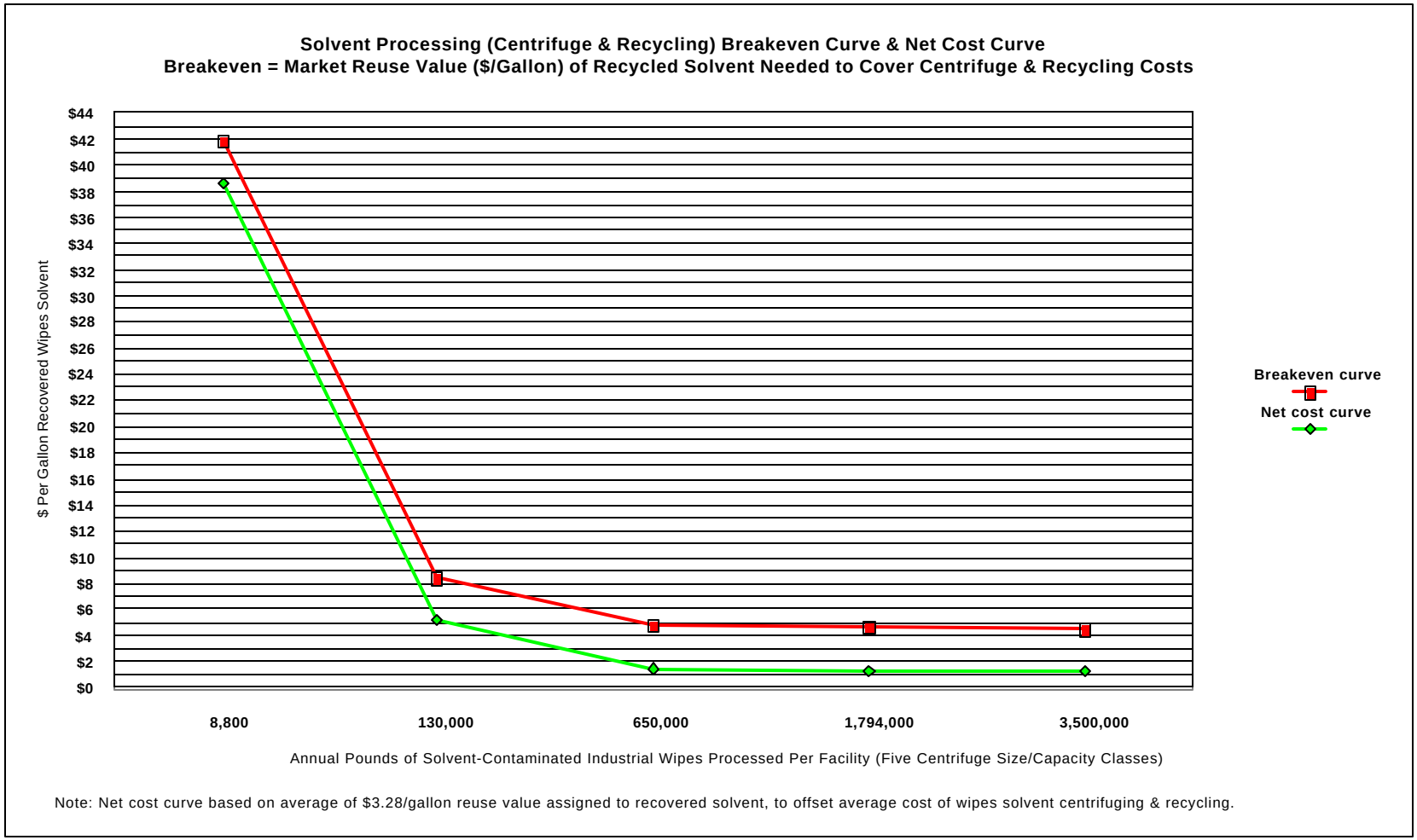
Centrifuge solvent recovery efficiency (ERG Memorandum to OSW, 04 April 2000, sheet 13 of 17) = 78%
Average cost based on data sample of onsite and offsite hazardous waste solvent recycling services ($/gal) = $2.54
Average reuse value of recycled solvent based on median price for sample of 43 solvents ranging in price from $0.75 to $6.19/gallon ($/gal) = $3.28
Assumed average specific gravity (density) of solvents applied to reusable industrial wipes (pounds per gallon of solvent) = 7.8

Average Net Cost Per-Wipe for Centrifuge & Solvent Recovery
(Including Average $3.28/Gallon Cost Offset Credit for Hypothetical Reuse Value of Recycled Solvent)



Note: $3.28/gallon reuse value based on median price for a sample of 43 solvents ranging in price from $0.75 to $6.19/gallon.

The graph below illustrates the hypothetical solvent reuse values required to achieve cost break-even for each of the five centrifuge size classes, relative to an average cost of $2.54/gallon for onsite and offsite solvent recycling, in addition to the costs for wipes centrifuging shown in the prior tables and graphs. The break-even curve displayed below suggests that onsite wipes centrifugation may only be beneficial (cost-effective) for the largest 16% of solvent wipes generating facilities and industrial laundry (i.e. generating or handling >650,000 pounds solvent-contaminated wipes per year), or for intra-company consolidation of centrifuge capacity for processing solvent wipes generated by multiple facilities, or for facilities which require premium-priced solvents (i.e. >$5.00/gallon in price) which capture relatively high reuse value from recycled premium-priced solvents.



II.J. Analytic Baseline

! State Policy Baseline:

Since 1991, the Federal RCRA policy has been to defer the regulatory disposition of solvent industrial wipes to EPA regional offices and to state regulatory agencies. This policy resulted in many states conditionally excluding reusable wipes from hazardous waste regulations. Consequently, the anticipated impact of the proposed exclusions will not be incremental relative to full RCRA regulatory compliance, but incremental to current state exclusions. This is the analytic baseline applied in this study.

! Full RCRA Subtitle C Baseline:

This alternative baseline is defined as hypothetical full compliance with Federal RCRA Subtitle C hazardous waste generation and treatment regulations, without either a Federal or state-level exclusion. This baseline includes hypothetical compliance with the RCRA hazardous waste "*derived-from*" rule (40 CFR 261.3(c)(2)(i)) which would hypothetically affect industrial laundry sludges, as well as the industrial wipes. Hypothetically, industrial laundry sludges could be regulated as RCRA hazardous wastes because of RCRA's "*derived-from*" rule. If the Federal RCRA Subtitle C hazardous waste standards governed current operations at industrial wipes laundries, the proposed exclusion would represent a relatively larger annual regulatory cost savings to industrial laundries, incremental to this hypothetical alternative RCRA Subtitle C compliance baseline.

To estimate this hypothetical cost savings, it is assumed that the annual costs associated with hypothetical full compliance with the RCRA Subtitle C regulations for hazardous waste generators (40 CFR 262), would be incurred by the 590 to 1,175 estimated range of industrial laundries which manage reusable industrial wipes contaminated with RCRA-listed solvents (see attached spreadsheets).

! Incomplete Compliance Baseline:

Assume partial non-compliance with existing state exclusions, such that the incremental implementation costs of the proposed exclusions would be greater, and the potential cost savings less, relative to the assumed full compliance baseline with the current state exclusions. Because USEPA does not have comprehensive information about the rate of non-compliance of industrial wipes users and handlers relative to this alternative third baseline, it is not presented in this report.

! Disposable Wipes Baseline Non-Compliance:

In itself, the Federal regulatory relief provided to disposables wipes users in form of cost savings for avoided RCRA Subtitle C disposal, largely drives the resultant difference in relative prices, and the consequent induced impact on industrial wipes marketshare between disposables and reusables. The findings summarized above are based on the baseline assumption that 100% of spent disposable solvent wipes generators currently manage their waste under RCRA Subtitle C requirements (baseline). However, baseline non-compliance will reduce the annual dollar value of the regulatory relief, thereby diminishing the difference in resultant relative prices, and consequent induced marketshare impact.

III. Description of US Industrial Wipes Market & Potentially Affected Establishments

III.A. Overview of "*Industrial Wipes*" in the US Economy

"***Industrial wipes***" come in a wide variety of types and brands to meet a broad range of applications. The major division is between ***reusable wipes***, which are laundered or dry cleaned and used again, and ***disposable wipes*** which are used for a single or limited number of applications, and then discarded. Disposable wipes include both non-woven and woven wipes, which are used by numerous industries in conjunction with solvents, to clean surfaces, parts, accessories, products, machines, and physical plant & equipment.

Definitions of "*Industrial Wipes*" Applied in This Study		
Category	Definitions of Wipes	
Disposable industrial wipes	*Industrial wipes*:	Non-woven towel consisting of wood pulp*, polyester blends or 100 percent polypropylene. These materials come in all sizes and thicknesses. They generally are designed for one time use and are used to wipe small quantities of solvents off hands, tools, equipment, or floors.
	Industrial rags:	Non-homogeneous material consisting of cotton or polyester fabric blends. Rags are made from old (waste) clothing, sheets, towels, or from cloth remnants from textile mills, and vary in size, color and type of fabric. Rags are typically used by facilities such as gas stations to apply and/or remove small quantities of solvents, grease, and oil from auto parts over the course of a day. After use, most rags are disposed of as part of a facility's regular, nonhazardous solid waste.
	Paper towels:	Sometimes used in conjunction with solvents in the workplace. These materials are made from wood pulp* with binders.

Category	Definitions of Wipes	
Reusable industrial wipes	*Industrial shop towels*:	Woven textile consisting of cotton (e.g. flannel, corduroy, terry, chenille, denim, sheeting, muslin, scrim) or polyester blends. These materials are a finite reusable item that are primarily water-wash laundered or solvent dry-cleaned a number of times (usually 10 to 15), before they outlive their usefulness and must be recycled or discarded. Shop towels are rented by industrial launderers to manufacturing, automotive, chemical, and other similar facilities for use in heavy-duty cleaning and wiping. Soiled shop towels are either washed or dry-cleaned at commercial laundry facilities.

Explanatory Notes:

(a) * For the purpose of encouraging paper and paper product recycling in the US, Subtitle F (Section 6002) of the 1976 RCRA requires Federal agencies to buy paper products (and other items) composed of the highest percentage of recovered materials practicable.

- In 1988 USEPA established the first "buy recycled" guidelines for paper and paper products containing recovered materials.
- In 1998 USEPA updated these guidelines, which currently recommend 40% to 100% recovered fiber content for industrial wipes, which should include at least 40% post-consumer fiber content (i.e. paper recovered from homes and offices); USEPA OSWER, "1998 Buy Recycled Series: Paper Products", EPA-530-F-98-012, July 1998, 8 pp., http://www.epa.gov/epaoswer/non-hw/procure/pdf/paper.pdf.
- In 2000 EPA identified 40 paper mill companies in the US and Canada which produce paper products from recovered paper, some of which manufacture industrial wipes: USEPA OSWER, EPA-530-B-99-012, Jan 2000, pp., http://www.epa.gov/cpg/products/tissue.htm.

(b) It is important to note that "***institutional wipes***" – another category of wipes which are used mainly by janitorial services, hospitals, schools, restaurants, hotels, and other service-related establishments – may also be affected by the proposed exclusions, but are not within the scope of this economic study as an itemized separate category of wipes, because the lack of explicit data on the extent to which institutional wipes are used in conjunction with RCRA-listed solvents suggests that there may be relatively small solvent wipes quantities involved, compared to the industrial categories covered in this study.

Industrial wipes are distinguished by their respective price, material composition (fabric type), color, size, durability, usage suitability characteristics, and disposal methods. The type of industrial wipe – paper or cloth wipe, shop towel, or rag – suitable for each application depends on a number of factors, some of which are summarized in the table below. Industrial wipes may be flat-packed or folded for delivery in 10, 25 or 50 pound boxes, or in 100, 150 or 1,000 pound bales, and dispensed to users in bulk cartons, pop-up box dispensers, or roll dispensers.

Physical Factors Affecting User Selection of Industrial Wipes Products	
Wipes Lint	The amount of lint residue – the loose, small particles of fuzz, fine ravelings and short fibers of fabrics and fabric-like materials – allowed in a particular industrial worktask or other wipes application, plays a large role in the selection of an appropriate industrial wipe, since some electronic equipment manufacturing or printing applications, for example, cannot tolerate any lint, while other industrial applications can tolerate large amounts of lint.
Wipes Absorbency	Wipes absorbency capacity – as measured by the relative quantity of solvent or other substances wipes are able to take up – and wipes absorbency rate (the amount of time it takes a wipe to absorb a particular quantity of solvent or other substance), also are two important factors in some industrial worktasks and wipes applications, while not in others.
Wipes Durability	Wipes durability is important in some wipes worktasks and applications, such as those that require heavy scrubbing, while often not important in tasks where lint or absorbency considerations are more important. Durability does not only refer to the physical strength of the wipe, but also to its ability to withstand contact (at different time durations) with strong chemical solvents, other substances, materials and surfaces. Some wipes manufacturers improve durability by reinforcement of wipes with multiple laminated layers (multi-ply), and/or nylon webbing. Industrial wipes are available for delicate tasks, critical tasks, general purpose tasks, and light-, medium- and heavy-duty tasks.

Once industrial wipes are used and are no longer suitable for their intended purpose, they become in whole or in part, **solid wastes** (if not completely recycled), and potentially **hazardous wastes**, depending upon the type of **solvent**[10] used in conjunction with the wipes.

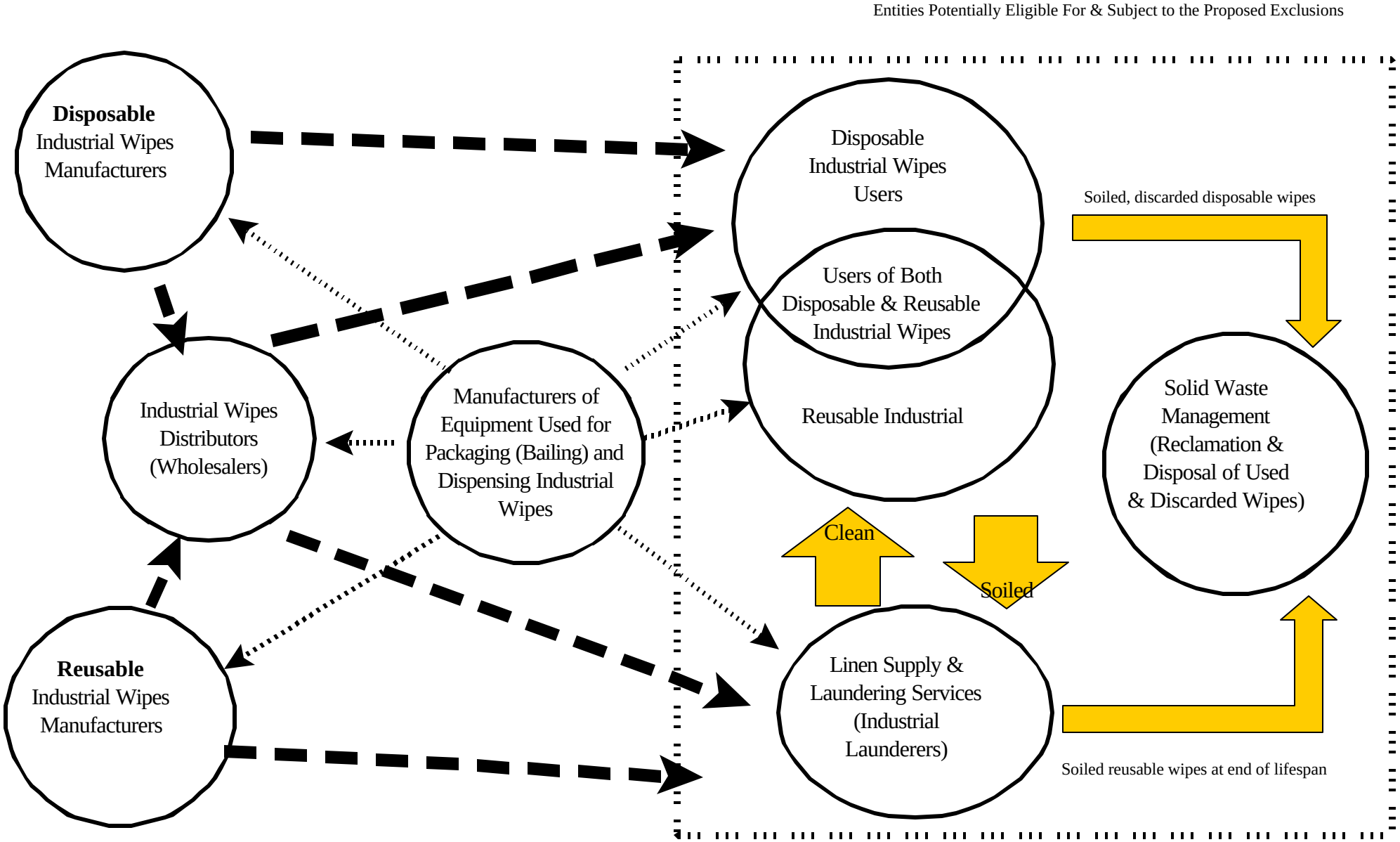
The use of industrial wipes in the US economy is depicted according to the simplified **material flow diagram** provided on the next page, which illustrates the origin, use, and ultimate disposition of industrial wipes in the economy, as symbolized box-flow relationships between different **economic sub-sectors**.

[10] "***Solvent***" = Usually a liquid used to dissolve, disperse, extract or mix one or more other substances or materials (other liquids or solids). Substances dissolved by solvents are usually called "*solutes*". "*Solvation*" is the physical and chemical process by which one or more substances dissolve into a solvent. The resultant "*solution*" (i.e. mixture of solvent and solutes) may be "*concentrated*" (i.e. a large proportional quantity of solutes are dissolved in the solvent) or "*dilute*" (i.e. small proportion of solutes relative to quantity of solvent).

Solvents have many different applications, are used in many different industrial processes, appear in many different household products, and consist of many different chemical (molecular) types. Water, which is one of the most abundant chemicals in nature, serves as a good solvent for many types of substances. During the last century, the largest manufactured chemical class of solvents used globally for industrial applications has been chlorinated aliphatic hydrocarbon chemicals, although other classes of chemicals may serve as solvents: cyclic hydrocarbons, aromatic hydrocarbons, ketones, amines, esters, ethers, glycols, alcohols, aldehydes, and carboxylic acids. By 1981 there were approximately 350 different solvents commonly in use in the USA (source: OSHA website), but there are over 30,000 industrial solvents (Corn, 1993, p.506).

Depending upon the physical and chemical characteristics of solvents compared to solutes, some substances may be completely miscible (soluble), partially miscible, or totally immiscible (not soluble) in a particular solvent. The solution process nearly always occurs with either an absorption or release of energy (heat); the quantity of energy that is absorbed (endothermic) or released (exothermic) when a substance is dissolved by a solvent is called the "*heat of solution*". For human health and safety information about solvents see the US Occupational Safety & Health Administration (OSHA) websites: http://www.osha-slc.gov/SLTC/solvents/ and http://www.osha.gov/oshinfo/priorities/solvents.html , and the reference book: Handbook of Hazardous Materials, Morton Corn (ed.), Academic Press Inc., 1993 ("Industrial Solvents" pp.387-398; "Organic Solvents Health Effects" pp.505-519).

Simplified Illustration of the Origin and Flow of "*Industrial Wipes*" in the US Economy



US Industrial Wipes Market: 1997 Economic Statistics on the Manufacturing & Supply of *Industrial Wipes*

A. Industrial Wipes Sub-Sector Statistics:

B. Industrial Wipes Product or Commodity Line Statistics:

Item	SIC Sub-Sector Code	NAICS Sub-Sector Code	NAICS Sub-Sector Code Description	NAICS Sub-Sector Total Number of Companies	NAICS Sub-Sector Total Number of Establishments	NAICS Sub-Sector Annual Revenues ($millions)	NAICS Product Code or Commodity Line Code	NAICS Product or Commodity Line Description	Total Number Establish-ments	Nr. Companies With >$100k Revenues	Revenues ($millions)
Production (Manufacturing) of Industrial Wipes (Disposables & Reusables):											
1	239910	314999	All other miscellaneous textile product mills mfg	2,163	2,237	$6,188.857	3149999451	Fabricated industrial shop towels (reusables)	No data	4	$37.289
2	262110	322121	Paper mills (except newsprint)	120	262	$40,184.049	322121N881	Industrial paper wipers (disposables)	No data	2	***
3	267620	322291	Sanitary paper product mfg	99	141	$9,770.017	3222915661	Industrial paper towels (disposables)	No data	10	$243.677
4							3222915881	Industrial paper wipes (disposables)	No data	8	***
5	5093	4219303	Other recyclable material wholesale trade	No data	4,020	$14,950.615	42193032941	Wiping cloths, waste rags, & textile waste (disposables)	488	No data	$880.970
Column subtotals (items 1+...+5) =				Incomplete data	6,660	$71,093.538			Incomplete data	Incomplete data	$1,325.249
Sub-total disposable wipes (items 2+3+4+5) =				Incomplete	4,423	$64,904.681			Incomplete	Incomplete	$1,287.96
Subtotal paper disposable wipes (items 2+3+4) =				Incomplete	403	$49,954.066			Incomplete	20	$406.99
Laundering of Reusable Industrial Wipes:											
6	7218	812332	Industrial launderers	796	1,613	$5,007.637	8123326303	Industrial wiping cloths	1,175	No data	$407.897
Column totals (items 1+...+6) =				Incomplete	8,273	$76,101.175			Incomplete	Incomplete	$1,733.146

Explanatory Notes:

(a) *** Total revenues for 322121N881 + 3222915881 = $163.313 million (source: US Dept of Commerce, Bureau of the Census, "NAICS Code 322291 Manufacturing - Industry Series", Appendix F, Part 1 Product Statistics, p.F-2, http://www.census.gov/prod/ec97/97m3222o.pdf).

(b) Sources: US Department of Commerce, Bureau of the Census "*1997 Economic Census*" documents:

- 1997 Economic Census: All Other Misc. Textile Product Mills Manufacturing, Table 6a, p.10 (http://www.census.gov/prod/ec97/97m3149e.pdf).
- 1997 Economic Census: Sanitary Paper Product Manufacturing, Table 6a, p.11 (http://www.census.gov/prod/ec97/97m3222o.pdf).
- 1997 Economic Census: Other Serivces, Table 1a, p.28 (http://www.census.gov/prod/ec97/97s81-ls.pdf).

III.B. Types of Entities Potentially Affected by the Proposed RCRA Exclusions

As itemized in the following table, the assessment of potential economic impact of the proposed exclusions in this report, focuses on **three categories** of entities which are potentially eligible and subject to the requirements of the proposed exclusions. In addition to three types of entities, there are at least **seven other categories** of entities that are involved in the US market for the supply, distribution and ultimate recycling/disposal of industrial wipes, that may also be ultimately affected by, but not directly subject to, the proposed exclusions.

Types of Entities Potentially Affected (Directly or Indirectly) by the Proposed RCRA Exclusions for Solvent-Contaminated Industrial Wipes		
Item	Type of Entities	Description of Entities
A. Entities Potentially Eligible for and Directly Subject to the Proposed RCRA Exclusions:		
1	Industrial wipes users	Facilities that use disposable or reusable industrial wipes in conjunction with chemical solvents (referred to as solvent-contaminated wipes "***generators***" in this study).
2	Industrial wipes laundries*	Industrial laundries that supply and clean the solvent-contaminated reusable wipes (e.g. shop towels).
3	Solid waste facilities	Discarded industrial wipes material recyclers, solid waste energy recoverers (combustors), and solid waste disposers.
B. Other Entities Involved in the Industrial Wipes Market, But Not Subject to the Proposed Exclusions:		
4	Industrial wipes manufacturers	Industrial wipes are manufactured by companies located in different countries around the globe. For example, USEPA's quick scan (Feb 2001) of dozens of assorted Internet search listings using the browser search phrase "industrial wipes", revealed that industrial wipes are manufactured and/or distributed in many countries (e.g. USA, Canada, United Kingdom, Pakistan, Turkey, India, Germany, Netherlands), and by at least 12 states within the USA (CA, CT, FL, GA, IN, KY, MA, NC, NY, PA, TX, WI).
5	Industrial wipes importers/exporters	Globally-manufactured industrial wipes are made available for export/import shipment to other countries (e.g. via Internet business orders), directly by manufacturers, or by other export distributors.

Item	Type of Entities	Description of Entities	
6	Industrial wipes transporters	Wipes manufacturers:	New (unused) Industrial wipes may be transported by wipes manufacturer- or distributor-owned trucks, or by independently-owned freight truck companies, to businesses which purchase wipes for assorted uses.
		Reusable wipes laundries:	Industrial laundry services usually transport clean and soiled reusable wipes from users to laundry facilities.
7	Industrial wipes equipment	Consists of manufacturers of industrial wipes bailing machines, bagging machines, bailed/bagged wipes conveyor machines, discarded wipes shredding machines, and discarded wipes combustion machines (USEPA's Feb 2001 quick Internet search yielded a list of 12 such companies).	
8	Industrial wipes business associations	At least 12 business associations (as of Feb 2001) are involved with the industrial wipes industry (in USA and abroad): Uniform & Textile Service Assn., Textile Rental Services Assn. of America, INDA - The Assn. of the Non-Woven Fabrics Industry, European Textile Services Assn., All India Yarn Processors Assn., Bureau International de la Recuperation, German Scrap, Recycling & Waste Disposal Assn., Institute of Scrap Recycling Industries, Secondary Materials & Recycled Textiles Assn., Textile Fibers & By-Products Assn., Textile Recycling Assn., Dutch Textile Recycling Assn.	
9	Industrial wipes material exchanges	Two Internet-based industrial wipes exchanges listed 335 wipes trading and wipes recycling companies (as of Feb 2001): • Textile Fiberspace Exchange (TFE) "Rags and Wipers Exchange" internet website: http://www.textilefiberspace.com/a/tx1410.html. • The Recycler's Exchange for rags & wipes: http://www.recycle.net/Textile/rag/index.html.	
10	Industrial wipes publications	USEPA identified nine publications targeted or containing information about the industrial wipes industry (Industrial Fabric Products Review, Magazine Recycling Benelux, Recycling International Magazine, Recycling Today, Recycling World Publication (UK), SCRAP magazine, Secondary Market Guide, Textile World, Used Equipment Directory).	

Item	Type of Entities	Description of Entities
Explanatory Notes: (a) * The USEPA's Design for the Environment (DfE) Program of the Office of Pollution Prevention & Toxics (OPPT) is partnering with industrial laundries and laundry detergent formulators to assist in designing and using products with improved environmental qualities (http://www.epa.gov/opptintr/dfe/laundry/laundry.html). (b) The DfE Program is also developing a series of case studies to illustrate how the DfE theme can be applied to managing solvents and industrial wipes in lithographic printing operations, with the objectives of substituting less volatile solvents used for cleaning, and reducing solvent quantities absorbed onto industrial wipes (http://www.epa.gov/opptintr/dfe/lithography/lithography.html).		

The remainder of this document addresses only the first three types of entities listed in the table above (i.e. items 1, 2, 3), which in part or in whole, may be eligible for and become subject to the conditions of the proposed exclusions after promulgation as a final rule (i.e. industrial wipes users, industrial wipes laundries, and solid waste facilities).

III.C. Types of Industries Which Use Solvent Industrial Wipes

The next table identifies **economic sectors, sub-sectors** and **industries** (mostly manufacturing), that use industrial wipes in conjunction with solvents for manual cleaning or degreasing wiping tasks. EPA derived this information through a literature search, and discussions with key stakeholders and industry contacts, who could further describe industry demographics with respect to the use of solvent-contaminated wipes. Another important source in identifying relevant industrial sectors was EPA's Office of Enforcement and Compliance Assistance (OECA) "*Industry Sector Notebooks*" which identified potential users of solvent-contaminated wipes by four-digit Standard Industrial Classification (SIC) code.[11]

In some industries, a large number of firms use wipes, such as printing and auto body repair. In other industries, smaller numbers of firms use wipes, but their usage can be considerable. Similarly, other sectors also might use hazardous solvents in conjunction with industrial wipes. For instance, we were unable to collect sufficient information about two other sub-sectors known to use industrial wipes, to include in this economic impact study:

- Instruments and related products manufacturers, and
- General building contractors sub-sectors

[11] USEPA OECA's "*Industry Sector Notebooks*" are available at the website: http://es.epa.gov/oeca/sector/ . As of year 2000, there were 32 OECA industry sector notebooks, as well as one on the local government sector, and one on the Federal facilities sector. These notebooks are classified according to the US Bureau of Census Standard Industrial Classification (SIC) code sytem (originated in the 1930's), which was replaced by the Federal government's 1997 adoption of the North American Industrial Classification System (NAICS) codes. The NAICS provides 1,170 total industry classifications, compared to 1,017 under the SIC system, including 358 new industries the SIC system did not identify (http://www.census.gov/epcd/www/naics.html).

In addition to industrial wipes "**users**", there are at least three other industries which otherwise "**handle**" industrial wipes:

- **!** Manufacturers of industrial wipes (disposables and reusables),
- **!** Service firms which supply, collect and launder industrial wipes for industry users, and
- **!** Solid waste management companies which receive spent (discarded) industrial wipes for ultimate disposal (or material reclamation/recycling).

As listed in the following table, in total there are at least **121 industries** using or otherwise handling solvent-contaminated industrial wipes, representing **15 economic sub-sectors** within **7 economic sectors** (i.e. manufacturing, retail trade, information, administrative services, other services, public administration, transportation & utilities).

List of Economic Sub-Sectors Which Use or Otherwise Handle Solvent *Industrial Wipes*					
Item	Sector (2-digit NAICS)	Sub-Sector (3-digit NAICS)	Wipes Activity	Industries Using/Handling Wipes (six-digit NAICS)	Industry count
A. Users of Solvent Industrial Wipes:					
1	Manufacturing	Printing	Wipes user	323110, 323111, 323112, 323113, 323114, 323115, 323116, 323117, 323118, 323119, 323121, 323122	12
2	Manufacturing	Chemical & Allied Products	Wipes user	211112, 32511, 32512, 325131, 325132, 325181, 325182, 325188, 325191, 325192, 325193, 325199, 325998, 331311	14
3	Manufacturing	Plastics & Rubber Products	Wipes user	31332, 315299, 315999, 325991, 326113, 326121, 32613, 32614, 32615, 32616, 326199, 326191, 326192, 326211, 32622, 326291, 326299, 337215, 339113, 339932, 339991	21
4	Manufacturing	Fabricated Metal Products	Wipes user	332812, 332813, 339911, 339912, 339914	5

Item	Sector (2-digit NAICS)	Sub-Sector (3-digit NAICS)	Wipes Activity	Industries Using/Handling Wipes (six-digit NAICS)	Industry count
5	Manufacturing	Industrial Machinery & Equipment	Wipes user	314999, 332323, 33241, 332991, 333111, 33312, 33322, 333295, 333298, 333319, 333414, 333511, 333512, 333513, 333514, 333515, 333518, 333911, 333923, 333999, 33651	21
6	Manufacturing	Electronics & Computers	Wipes user	334411, 334412, 334413	3
7	Manufacturing	Transportation Equipment**	Wipes user	332912, 336111, 336112, 336211, 33633, 33634, 336399, 336312, 336411, 336412, 336414, 336415, 336419, 336612, 336992, 48839, 54171, 81149	18
8	Manufacturing	Furniture & Fixtures	Wipes user	337115, 337121, 337122, 337124, 337127, 337211, 337212, 337215	8
9	Retail Trade	Auto Dealers	Wipes user	44111, 44112	2
10	Information	Publishing (print)	Wipes user	51111, 51112, 51113, 51114, 51119	5
11	Administrative Services	Business Service Centers (copy shops)	Wipes user	561439	1
12	Other Services	Auto Repair & Maintenance	Wipes user	811111, 811112	2
13	Public Administration	Military Bases	Wipes user	92812	1
				Subtotal industrial wipes “user” industries =	**113**

Item	Sector (2-digit NAICS)	Sub-Sector (3-digit NAICS)		Wipes Activity	Industries Using/Handling Wipes (six-digit NAICS)	Industry count
B. Other Handlers of Solvent-Contaminated Industrial Wipes:						
14	Transportation & Utilities	Solid Waste Mngmt	Non-hazardous wastes	Discarded wipes disposer (if RCRA-excluded)	562111, 562212, 562213, 562219, 56292	5
			Hazardous wastes	Discarded wipes disposer (if RCRA C regulated)	562112, 562211	2
15	Other Services	Linen supply & laundering (reusables)		Wipes laundry & distributor	812332 (8123326303 = industrial wiping cloths)	1
					Subtotal industrial wipes "other handler" industries =	**8**
					Total NAICS code industry count =	**121**

Explanatory Notes:

(a) Source: USEPA Office of Enforcement & Compliance Assistance (OECA) "*Industry Sector Notebooks*": http://es.epa.gov/oeca/sector/ , and consultation with RCRA regulatory stakeholders (industry associations, USEPA regional offices, state government officials, as identified in the minutes to the USEPA Office of Solid Waste stakeholder meeting of 21 Jan 2000.

(b) * NAICS = North American Industrial Classification System (http://www.census.gov/naics).

(c) ** USEPA in this study did not collect comprehensive information about industrial wipes usage for transportation equipment manufacturing.

(d) In addition to the **15 sub-sectors** listed above in this table, USEPA suspects, but has no corroborative data, that at least the following two other sub-sectors, representing **22 other industries**, may use industrial wipes, because of similarities in some worktasks in these sub-sectors (i.e. cleaning, wiping), to the known user sub-sectors. However, these two sub-sectors are excluded from this economic analysis:

16. General Building Contractors (Construction) = 23321, 23322, 23331, 23332 (4 industries)
17. Instruments & Related Products Mfg = 325992, 333314, 333315, 334510 to 334519, 339111to 339115 (18 industries)

In addition to the 15 sub-sectors listed in the table above, there are at least **six other industries** which are directly or indirectly interlinked with the supply and use of solvent industrial wipes in the national economy, as listed in the next table.

List of Other Industries Which Are Directly or Indirectly Interlinked With the Supply and Use of Solvent Industrial Wipes in the National Economy

Item	Sector (2-digit NAICS)	Sub-Sector (3-digit NAICS)	Industry (6-digit NAICS)	Product Code (7- to 10-digit NAICS)		1997 Count of Companies*
A. Solvents:						
1	Manufacturing	Petroleum & Coal Products	Petrochemicals	Aromatics (benzene, toluene, xylene, etc.) not made in a refinery	3251101	38
2	Manufacturing	Chemicals	All other basic organic chemicals	Other synthetic organic chemicals nec	325199R,T,U, W	451
B. Containers (storage & shipment of industrial wipes):						
3	Manufacturing	Plastics & Rubber Products	Unsupported plastics bags	Other polyethylene specialty bags, pouches, drum & box liners, shipping sacks	32611115	175
4	Manufacturing	Plastics & Rubber Products	All other plastics products	Plastics packaging (pails, drums, shipping cases, etc.)	32619941	747
5	Manufacturing	Fabricated Metal Products	Fabricated metal drums & pails manufacturing industry	Steel shipping barrels & drums (more than 12 gallon capacity, excluding beer barrels)	3324393100	37
C. Other Sub-Sectors:						
6	Manufacturing	Printing & Related Support Activities	Other commercial printing	Label & wrapper printing	3231192	128
					Subtotal =	>1,576

Explanatory Notes:

(a) * Count of companies based on 1997 Economic Census "number of companies with shipments of $100,000 or more", so the count shown may understate the total number of companies, by excluding small companies with less than $100,000 in annual shipments.

(b) Data on number of establishments at the NAICS Product Code level are not available from the Census website (http://www.census.gov/prod/ec97).

Across the above **22 sub-sectors** (i.e. 13 users + 2 other handlers + 2 suspected users + 5 other associated sub-sectors), the total number of industries associated with industrial wipes uses and other handling is **149 industries** (i.e. 113 users + 8 other handlers + 22 suspected users + 6 other associated sub-sectors).

The following table presents EPA-OSW's best estimates about how each of the 13 economic sub-sectors that generate solvent-contaminated industrial wipes use those industrial wipes, the average daily volume of industrial wipes used per facility in each sub-sector, the relative volume of wipes used between disposables and reusables, and the prevalent types of solvents used in conjunction with industrial wipes.

Not all industrial solvent wipes users are subject to RCRA hazardous waste regulations. RCRA regulations apply to those solvent wipes users which generate monthly quantities of solvent-contaminated wipes which exceed either the "small-quantity generator" (SQG) or "large-quantity generator" (LQG) thresholds. Furthermore, the RCRA program already excludes the third category "conditionally-exempt small-quantity generators" (CESQGs) from RCRA Subtitle C hazardous waste regulation:

RCRA Hazardous Waste Generator Quantity Categories

Generator Category	Threshold Quantity (in any calendar month)
CESQG	<220 pounds (0.11 ton)
SQG	>220 pounds (0.11 ton) but <2,200 pounds (1.1 ton)
LQG	2,200 pounds (1.1 ton) or more

Explanatory Notes:

- SQGs: As of 1999 there are approximately 20,000 LQGs (source: USEPA RCRA Hazardous Waste "Biennial Report" database), 289,000 SQGs (source: ICF Inc. 31 July 2000 memo to USEPA-OSW);
- CESQGs: Between 455,000 to 700,000 CESQGs (source: USEPA report EPA-530-R-98-004, May 1998, p.III-47).

USEPA Estimate of *Industrial Wipes* and Solvent Usage According to Economic Sub-Sectors (1995-97 data)						
Item	Economic Sub-Sector	How Wipes Are Used in Sub-Sector (Worktasks)	Average Daily Quantity Wipes Used SingleFacility	Types of Wipes Used**		Prevalent Types of Wipe Solvents
				Reusables	Disposables	
1	Printing*	Cleaning	200 to 6,000	60% to 99%	1% to 40%	Mineral spirits, terpenes, hexane, heptane, ethanol, methanol, isopropanol, 2-butoxy ethanol, methyl ethyl ketone (MEK), acetone, xylene, toluene, glycol ethers, ammonia, amines, fatty acids, surfactants, acetates; USEPA June 1994, EPA-744-R-94-003, http://www.epa.gov/opptintr/dfe/pubs/printing/cluster/index.htm
2	Chemical & Allied Products Mfg	Wiping	25 to 50	25%	75%	No data
3	Plastics & Rubber Products Mfg	Wiping	25 to 50	50%	50%	No data
4	Fabricated Metal Products Mfg	Wiping	25 to 50	50%	50%	Benzene, methyl ethyl ketone, methyl isobutyl ketone, toluene, xylene, carbon tetrachloride, methylene chloride, 1,1,1-trichloroethane, perchloro-ethylene, kerosene, mineral oil, glycols; USEPA Sept 1995, EPA-310-R-95-007, http://es.epa.gov/oeca/sector/sectornote/pdf/fabmetsn.pdf
5	Industrial Machinery & Eqpt Mfg	Wiping	25 to 50	50%	50%	No data
6	Electronics & Computers Mfg	Wiping	100 to 5,000	25%	75%	Isopropanol (isopropyl alcohol) , methanol, acetone, lacquer thinner
7	Transportation Equipment Mfg	Wiping & cleaning	25 to 1,500	25% to 75%	25% to 75%	MEK, (TCE), acetone, ethyl acetate, isopropanol, denatured alcohol (ethanol), methyl isobutyl ketone (MIBK), toluene, mineral spirits, xylene, naptha, ethylene glycol, paint thinners, Stoddard solvent, monoethyl ether acetate, methanol, cyclohexanone, n-butyl acetate, perchloroethylene (PERC), methyl propyl ketone (MPK), petroleum naptha

Item	Economic Sub-Sector	How Wipes Are Used in Sub-Sector (Worktasks)	Average Daily Quantity Wipes Used SingleFacility	Types of Wipes Used**		Prevalent Types of Wipe Solvents
				Reusables	Disposables	
8	Furniture & Fixtures Mfg	Wiping	7 to 25 drum loads	.100	.0	Lacquer thinner (solvent-borne nitrocellulose), methyl isobutyl ketone, methyl ethyl ketone, xylene, toluene, 1,1,1-trichloroethane, mineral spirits, alcohol; USEPA Sept 1995, EPA-310-R-95-003, http://es.epa.gov/oeca/sector/sectornote/pdf/wdfurnsn.pdf
9	Auto Dealers (retail trade)	Wiping	50 to 100	.100	.0	Mineral spirits, ignitable solvents (RCRA wastecode D001).
10	Publishing (printed matter)	Cleaning	200 to 6,000	60% to 99%	1% to 40%	Mineral spirits, methyl ethyl ketone (MEK), acetone, xylene, toluene, isopropyl alcohol
11	Business Services (copy shops)	Cleaning	200 to 6,000	60% to 99%	1% to 40%	Mineral spirits, methyl ethyl ketone (MEK), acetone, xylene, toluene
12	Auto Repair & Maintenance*	Wiping	50 to 100	.100	.0	Mineral spirits, ignitable solvents (RCRA wastecode D001).
13	Military Bases	Wiping & cleaning	25 to 500	50%	50%	MEK, methylene chloride

Explanatory Notes:

(a) Sources: Unless otherwised specified in this table, USEPA Office of Solid Waste (Hazardous Waste Information Division) "best estimates", based on information supplied by:
- ! industry contacts familiar with wipes usage
- ! industrial site visits
- ! USEPA industrial inspectors
- ! Uniform & Textile Services Association (UTSA) "*Customer Profile Analysis for 1996*"

(b) Relative marketshare data derived from information provided on the total shop towel revenue earned from customers in each industry.

(c) * For the printing and auto repair industries, also see: USEPA Office of Research & Development, National Risk Management Research Laboratory, "Environmental Assessment of Shop Towel Usage in the Automotive and Printing Industries", prepared by W. Pullman, M. Wolf, R. Thomas, P. Fitzpatrick, P. Craig, Lockheed Martin Environmental Systems & Technologies, Las Vegas NV, Nov 1996.

(d) Additional information about industrial solvents is available from: http://www.americansolventscouncil.com and http://www.solventcentral.com

1997 Economic Characteristics of Sub-Sectors Containing Establishments Which Use or Otherwise Handle Solvent-Contaminated *Industrial Wipes*

Item	Economic Sub-Sector Used as Benchmark		1997 Data References NAICS	1997 Data References SIC	Count of Benchmark Sub-Sector Companies (i.e. firms)*	Benchmark Sub-Sector Establishments (i.e. plants or facilities) NAICS Count	NAICS Employees	NAICS Revenues ($1,000s)
A. Sub-Sectors With Establishments That Use Solvent Industrial Wipes:								
1	Printing Mfg		323	275 to 279	38,797	42,916	838,240	$97,944,985
2	Chemical & Allied Products Mfg		325	280	8,808	13,513	884,321	$419,617,444
3	Plastics & Rubber Products Mfg		326	300	13,762	16,876	1,029,976	$160,317,732
4	Fabricated Metal Products Mfg		332	340	35,149	62,501	1,774,874	$243,254,492
5	Industrial Machinery & Eqpt Mfg		333	352 to 356	24,563	30,665	1,421,820	$270,357,157
6	Electronics & Computers Mfg		3344	367	5,986	6,270	588,938	$139,708,587
7	Transportation Eqpt Mfg		336	370	11,159	12,980	1,848,558	$571,979,634
8	Furniture & Fixtures Mfg		337	250	11,442	20,758	604,845	$63,939,540
9	Auto Dealers (retail trade)		4411	5511 + 5521	46,220	46,237	1,138,995	$553,652,292
10	Publishing (printed matter)		5111	271 to 274	17,820	21,806	739,834	$117,336,003
11	Business Services (copy shops)		561439	7334	4,105	5,780	87,221	$6,844,260
12	Auto Repair & Maint. Services		8111	753	151,821	164,360	815,149	$62,200,597
13	Military Bases		92812	9721	5***	588	1,438,562	$0
				Subtotal Users =	369,637	**445,250**	13,211,333	$2,707,152,723
B. Sub-Sectors With Establishments That Otherwise Handle Solvent-Contaminated Industrial Wipes:								
14	Solid Waste Mngmnt	Non-haz	5 codes**	4953	8,011	9,650	183,407	$26,883,540
		Hazardous	2 codes**		703	926	26,284	$3,973,535
15	Linen supply & laundering (reusable industrial wipes)		812332	7218	796	1,613	81,908	$5,007,637
				Subtotal Other Handlers =	9,510	12,189	291,599	$35,864,712
				Column totals =	379,147	**457,439**	13,502,932	$2,743,017,435

Explanatory Notes:

(a) Sources: (1) US Dept of Commerce, Bureau of the Census, "*1997 Economic Census*":
NAICS code data: http://www.census.gov/epcd/www/econ97.html
SIC code data: http://www.census.gov/epcd/ec97sic/97x-cs2.pdf
(2) US Small Business Administration (SBA) Office of Advocacy "Firm Size Data Provided by the US Census Bureau", http://www.sba.gov/advo/stats/us97_s4.pdf.
(3) US Dept of Defense "Fiscal Year 96 Worldwide List of Military Installations: Major, Minor & Other", http://www.defenselink.mil/pubs/installations/.
(4) US Dept of Defense, Directorate for Information Operations & Reports, "Military Personnel Statistics", http://web1.whs.osd.mil/mmid/military/miltop.htm.

(b) * Sub-sector company count data may be based on either the NAICS code or the SIC code data, or a mix of both, depending upon availability of 1997 economic data from the Bureau of Census website at the date of this report. The scope (i.e. number of companies, establishments, employees, revenues) of the NAICS code may not exactly match the scope of the SIC code shown.

(c) The Census Bureau defines a "***company***" as a business organization consisting of one or more establishments under common ownership or control.

(d) The Census Bureau defines an "***establishment***" as a single physical location at which business is conducted and/or services are provided. It is not necessarily identical with a "***company***" (firm) or "***enterprise***", which may consist of one establishment (i.e. ***plant*** or ***facility***) or more. Economic Census data represent individual establishments rather than companies, with one employee or more and establishments in operation at any time during the year.

(e) ** Disaggregated "*1997 Economic Census*" data for the seven solid waste mgnt codes are provided in an appendix to this report.

(f) *** Military base "companies" consist of five US Dept of Defense organizations: Army, Army Guard, Navy, Air Force, & Marines; the count of military base "establishments" includes domestic and foreign locations.

(g) Company revenues in this table only associated with company-owned establishments classified in these particular sub-sectors, which may not represent all company-owned establishments and all sources of company revenues for any given company.

Uniform Benchmark of Small Companies in Economic Sub-Sectors Which Use or Otherwise Handle Solvent-Contaminated *Industrial Wipes*							
	Economic Sub-Sector			1997 Count of Companies by Company Employee Classes		Company 1997 Revenues ($1,000s) by Company Employee Classes	
Item	Name	NAICS	SIC code	Total**	<500 employees*	NAICS	<500 employees*
A. Users of Solvent Industrial Wipes:							
1	Printing Mfg	323	2750 to 2790	38,797	38,398	$97,944,985	$55,807,309
					99.0%		57.0%
2	Chemical & Allied Products Mfg	325	2800	8,808	8,227	$419,617,444	$60,844,529
					93.4%		14.5%
3	Plastics & Rubber Products Mfg	326	3000	13,762	13,043	$160,317,732	$58,740,417
					94.8%		36.6%
4	Fabricated Metal Products Mfg	332	3400	35,149	34,250	$243,254,492	$119,380,207
					97.4%		49.1%
5	Industrial Machinery & Equipment Mfg	333	3520 to 3560	24,563	23,654	$270,357,157	$107,542,229
					96.3%		39.8%
6	Electronics & Computers Mfg	3344	3670	5,986	5,646	$139,708,587	$28,360,843
					94.3%		20.3%
7	Transportation Equipment Mfg	336	3700	11,159	10,653	$571,979,634	$45,500,385
					95.5%		8.0%
8	Furniture & Fixtures Mfg	337	2500	11,442	11,217	$63,939,540	$27,441,677
					98.0%		42.9%
9	Auto Dealers (retail trade)	4411	5511+5521	46,220	46151	$553,652,292	$519,433,489
					99.9%		93.8%
10	Publishing (printed matter)	5111	2710 to 2740	17,820	17,679	$117,336,003	$51,334,091
					99.2%		43.7%
11	Business Service Centers (copy shops)	561439	7334	4,105	4,094	$6,844,260	$2,959,323

Item	Economic Sub-Sector				1997 Count of Companies by Company Employee Classes		Company 1997 Revenues ($1,000s) by Company Employee Classes	
	Name		NAICS	SIC code	Total**	<500 employees*	NAICS	<500 employees*
						99.7%		43.2%
12	Auto Repair & Maintenance Services		8111	7530	151,821	151,791	$62,200,597	$58,966,166
						99.9%		94.8%
13	Military Bases		92812	9721	5	0	$0	$0
				Subtotal Users =	369,637	364,803	$2,707,152,723	$1,136,310,665
						98.7%		42.0%
B. Other Handlers of Solvent-Contaminated Industrial Wipes:								
14	Solid Waste Mgmt	Non-hazardous waste	5 codes	4953	8,011	7,982	$26,883,540	$11,385,942
						99.6%		42.4%
		Hazardous waste	2 codes		703	695	$3,973,535	$2,755,437
						98.8%		69.3%
15	Linen supply & laundering (reusable wipes)		812332	7218	796	761	$5,007,637	$1,397,131
						95.6%		27.9%
				Subtotal Other Handlers =	9,510	9,438	$35,864,712	$15,538,510
						99.2%		43.3%
				Column totals =	379,147	374,241	$2,743,017,435	$1,151,849,175
						98.7%		**42.0%**

Explanatory Notes:

(a) Source: US Small Business Administration Office of Advocacy "*1997 Firm Size Data Provided by the US Census Bureau*", http://www.sba.gov/advo/stats/us97_s4.pdf

(b) The US Dept of Commerce Census Bureau defines "*company*" as a business organization consisting of one or more establishments (i.e. facilities or plants) under common ownership or control.

(c) * Less than 500 employees does not necessarily represent in this table the SBA small business standard for each sub-sector; this numerical limit serves in this table, as a uniform benchmark for characterizing the proportion of small companies across all sub-sectors.

(d) ** Count of companies (firms) may be based on either the corresponding NAICS or SIC code total for each sub-sector (i.e. 1997 Census firm count data by NAICS code were unavailable for manufacturing sub-sectors from the Census website at the date of this study).

(e) Company revenues in this table only associated with company-owned establishments classified in these particular sub-sectors, which may not represent all company-owned establishments and all sources of company revenues for any given company.

The next table displays the US Small Business Administration's small business size standards for the 15 sub-sectors which use or otherwise handle spent industrial wipes. The next table also provides a count of the number of small-sized companies relative to the total number of companies in each sub-sector, and a count (for five component sub-sectors) of the number of establishments (i.e. individual facilities or plants) operated by small companies, relative to the number of all establishments in each sub-sector.

This table indicates that small businesses constitute from 93% to nearly 100% of companies within the 15 sub-sectors, with an overall average of **99%** (i.e. 374,241 small companies out of a total 379,147 companies). In comparison, a smaller percentage of revenues in these sub-sectors are earned by small companies, ranging from 8% to 95%, with an overall average of **42%** (i.e. $1.151 trillion of the sub-total $2.743 trillion in 1997 annual revenues earned across these 15 sub-sectors).

Small Business Size Determination for Economic Sub-Sectors Using Solvent *Industrial Wipes*

Item	Economic Sub-Sector		SBA Small Business Size Standards		1997 Count of Companies (Firms)			1997 Count of Establishments (Facilities or Plants)		
						SBA Small Firms			SBA Small Firm Establishments	
	Name	NAICS Code	Maximum Company Annual Revenues	Maximum Company Employees	Total Count	Small	%Small	NAICS Total Count	Small	%Small
A. Sub-Sectors With Establishments That Use Solvent Industrial Wipes:										
1	Printing Mfg	323		500	38,797	38,398	99.0%	42,916	No data	No data
2	Chemical & Allied Products Mfg	325		500**	8,808	8,227	93.4%	13,513	No data	No data
3	Plastics & Rubber Products Mfg	326		500**	13,762	13,043	94.8%	16,876	No data	No data
4	Fabricated Metal Products Mfg	332		500**	35,149	34,250	97.4%	62,501	No data	No data
5	Industrial Machinery & Eqpt Mfg	333		500**	24,563	23,654	96.3%	30,665	No data	No data
6	Electronics & Computers Mfg	3344		500**	5,986	5,646	94.3%	6,270	No data	No data
7	Transportation Eqpt Mfg	336		500**	11,159	10,653	95.5%	12,980	No data	No data
8	Furniture & Fixtures Mfg	337		500	11,442	11,217	98.0%	20,758	No data	No data
9	Auto Dealers (retail trade)	4411	$17 to $21 million		46,220	38,825	84.0%	49,237	39,347	79.9%
10	Publishing (printed matter)	5111		500	17,820	17,679	99.2%	21,806	19,789	90.8%

11	Business Services (photo-copy shops)		561439	$5 million		4,105	4,008	97.6%	5,780	4,000	69.2%
12	Auto Repair & Maint. Services		8111	$5 million		151,821	151,236	99.6%	164,360	154,162	93.8%
13	Military Bases		92812	NA	NA	5	0	0%	588	0	0%
					Subtotal Users =	369,637	356,836	96.5%	**448,250**	**373,953 (est.*)**	83.4% (est.*)
B. Sub-Sectors With Establishments That Otherwise Handle Solvent-Contaminated Industrial Wipes:											
14	Solid Waste Mgmnt	Non-haz	5 codes	$10 million		8,011	7,655	95.6%	9,650	7,746	80.3%
		Haz	2 codes	$10 million		703	613	87.2%	926	628	67.8%
15	Linen supply & laundering		812332	$10.5 million		796	744	93.5%	1,613	756	46.9%
					Subtotal Other Handlers =	9,510	9,012	94.8%	12,189	9,130	74.9%
					Column totals =	379,147	365,848	96.5%	460,439	405,524	88.1%

Explanatory Notes:

(a) Sources: (1) US Small Business Administration (SBA) "size standards" (http://www.sba.gov/size). The 1980 Regulatory Flexibility Act (Section 601(3)) requires Federal regulatory agencies to apply the SBA definition of "*small business*", which are maximum thresholds based on annual revenues or number of employees. (2) Company and establishment data from US Dept of Commerce Census Bureau "*1997 Economic Census*" (http://www.census.gov/epcd/www/econ97.html).

(b) * est. = estimates by USEPA-OSW-EMRAD, based on subtotal percentage of small company establishments for sub-sector items 9 to 12, applied to the total count of establishments (i.e. [79.9% + 90.8% + 69.2% + 93.8%]/4 = 83.4%). Over the small company establishment percentage range for the six sub-sectors above of 46.9% to 93.8% (items 9-12,14,15), this estimate of total small company establishments ranges from **210,229 to 420,458**.

(c) ** Indicates that 500 employees applied in this document as the SBA size standard for six sub-sectors which are composed of some industries that have 750 or 1,000 employee size standards as set by the SBA. Use of 500 employees for these six sub-sectors facilitates the convenient use of employment size of firm data from the "*1997 Economic Census*" (as compiled by the SBA Office of Advocacy http://www.sba.gov/advo/stats/data.html) – which is categorized into "<20 employees", "<500 employees" and "500+ employees" data bins – to determine the number of small companies in these sub-sectors.

(d) *** USEPA Office of Solid Waste estimate based on NAICS code small company total counts, multiplied by SIC code small company percentages.

IV. Attachments (Spreadsheets & Tables)

IV.A. Supplemental Data

Set A: **Count of Establishments & Count of Industrial Wipes Data**
Set B: **Industrial Laundry Data**
Set C: **Industrial Cleaning/Degreasing Solvent Data**
Set D: **Price-Elasticity of Demand for Industrial Wipes: Meta-Analysis**

IV.B. Impact Estimation

Set E: **Direct Impact Elements**
Set F: **Induced Market Impacts (partial equilibrium model)**
Set G: **Small Business Impacts**

Attachment Set A

Count of Establishments & Count of Industrial Wipes Data

Data Sources for Facility Count & Wipes Quantities Applied in the Economic Impact Model For OSW's *"Solvent Industrial Wipes"* Rule

A. Count of Wipes User Facilities:

Disposable wipes:	Source: 1997 estimates of all industrial disposable wipes-using facilities (i.e. CESQGs + SQGs + LQGs) w/ and without solvents, for both "printer" (n= 4,948) and "non-printer" (n= 34,948) industries, as provided to Jim O'Leary (USEPA-OSW), by the "INDA" (Assoc. of the Nonwoven Fabrics Industry).	
Reusable wipes:	Source: The mathematical difference between the 448,250 total 1997 Census (NAICS code) count of establishments (i.e. CESQGs + SQGs + LQGs) in the 13 industries known to use industrial wipes w/ & wout solvents, and the INDA estimates for disposables. OSW made distinction in the total Census count between three "printer" industries (n= 70,502) and ten "non-printer" industries (n= 377,748). The resultant 1997 total count of reusable wipes facilities (w & w/out solvents) is 65,554 printers & 342,800 non-printers.	
OSW adjustments to facility data:	! 2001 update:	Updated 1997 facility count data to year 2001 based on extrapolating the 1987-1992-1997 Census trend of establishments in each of the 13 industries (1.050 multiplier)
	! Solvent wipes subset:	OSW estimated the subset of facilities which apply RCRA-listed solvents to industrial wipes, by "most-likely" assuming:
		! 100% of printers (90%LB to 100%UB)
		! 35% of non-printers (30%LB to 40%UB) apply solvents to both disposable & reusable wipes.
	! CESQG/ SQG/ LQG:	! LQGs based on actual count of LQGs in the 1995 RCRA "*Biennial Reporting System*" registry of RCRA LQGs;
		! SQGs for printer industries assumed to constitute all remaining facilities (i.e. zero CESQGs);
		! SQGs for non-printer industries assumed 50% of all facilities, with CESQGs the mathematical remainder.
	! % states adopting:	Applied 75% "most likely" multiplier to facility count (50% LB to 100% UB).

B. Quantity of Annual Solvent Wipes:

Disposable wipes	Same 1997 source as facility data (see above) = 1.009 billion wipes, consisting of: 49.8 million printer wipes + 959.2 million non-printer wipes (CESQGs+SQGs+LQGs)	
Reusable wipes	USEPA Office of Water data from 1994 industrial laundry industry Section 308 survey for prior OW rulemaking regarding laundry effluent wastewaters:	
	! Printers:	136.5 million lbs wipes (w/ & w/out solvents) x 11 wipes/lb
	! Non-printers:	344.7 million lbs wipes (w/ & w/out solvents) x 16 wipes/lb
OSW adjustments to wipes data:	! 2001 update:	! 1994 reusables wipes data standardized to 1997 facility data benchmark year according to 10% sales growth in industrial laundry sector (SIC 7218) between 1994 & 1997
		! Both reusables & disposables wipes data updated to 2001 based on average annual growth 1986-2000 in "*Industrial Production Index*" in each of the 13 wipes using sub-sectors (1.128 multiplier).
	! Solvent wipes subset:	Same adjustment as applied to facility data (see above).
	! CESQG/ SQG/ LQG:	OSW "best judgement" assumptions that:
		! CESQGs use 20% of both disposable & reusable wipes
		! SQGs use 70% of both disposable & reusable wipes
		! LQGs use 10% of both disposable & reusable wipes
	! % states adopting:	Same adjustment as applied to facility data (see above).

1997 Economic Characteristics of Sub-Sectors With Establishments That Use or Handle Industrial Wipes								
Item	Sub-sector or Industry		Census NAICS code	Census SIC code	1997 Census count of companies*	1997 NAICS count of estblshmts	1997 NAICS count of employees	1997 NAICS revenues ($1,000)
A. Sub-Sectors With Establishments That Use Industrial Wipes:								
1	Printing		323	2750 to 2790	38,797	42,916	838,240	$97,944,985
2	Chemical & Allied Products		325	2800	8,808	13,513	884,321	$419,617,444
3	Plastics & Rubber		326	3000	13,762	16,876	1,029,976	$160,317,732
4	Fabricated Metal Products		332	3400	35,149	62,501	1,774,874	$243,254,492
5	Industrial Machinery & Eqpt		333	3520 to 3560	24,563	30,665	1,421,820	$270,357,157
6	Electronics & Computers		3344	3670	5,986	6,270	588,938	$139,708,587
7	Transportation Eqpt		336	3700	11,159	12,980	1,848,558	$571,979,634
8	Furniture & Fixtures		337	2500	11,442	20,758	604,845	$63,939,540
9	Auto Dealers (retail trade)		4411	5511 + 5521	46,220	49,237	1,138,995	$553,652,292
10	Publishing (printed matter)		5111	2710 to 2740	17,820	21,806	739,834	$117,336,003
11	Business services (copy shops)		561439	7334	4,105	5,780	87,221	$6,844,260
12	Auto Repair & Maintenance		8111	7530	151,821	164,360	815,149	$62,200,597
13	Military Bases		92812	9721	5	580	1,438,562	$0
	Subtotals (1+...+13) =				369,637	448,242	13,211,333	$2,707,152,723
B. Sub-Sectors With Establishments That Otherwise Handle Industrial Wipes:								
14	Solid Waste Mgmt	Non-haz wastes	5 codes (562xxx)	4953	8,011	9,650	183,407	$26,883,540
		Haz wastes	562112 & 562211	with 4953	703	926	26,284	$3,973,535
15	Linen Supply & Laundering**		812332	7218	796	1,613	81,908	$5,007,637
	Cleaning industrial wipes (73%***)		8123326303			1,175		$407,897
	Only cleaning ind. wipes (1.4%****)					23		
	Subtotals (14+...+15) =				8,807	11,263	265,315	$31,891,177
C. Total All Establishments That Use or Handle Industrial Wipes:								
	Item totals (1+...+15) =				**378,444**	**459,505**	**13,476,648**	**$2,739,043,900**

Explanatory Notes:

(1) * Company count may be based on either NAICS or SIC code for a particular sub-sector, depending upon data availability from the Bureau of Census "1997 Economic Census" website, at the date of this research by OSW-EMRAD (Feb 2001).

(2) ** Linen Supply & Laundering facilities launder up to 20 different types of textile items.

(3) *** 73% of industrial laundries, based on "1997 Economic Census" NAICS product code 8123326303 for "industrial wiping cloths": (http://www.census.gov/prod/ec97/97s81-1s.pdf). In comparison, USEPA Office of Water estimated 78% in the following report: "Economic Assessment for the Final Action Regarding Pretreatment Standards for the Industrial Laundries Point Point Source Category", EPA-821-R-00-004, March 2000, p. 3-8, http://www.epa.gov/ost/guide/laundry/final/economics.pdf.

(4) **** USEPA Office of Water estimates that only 1.4% of these laundries exclusively devoted to industrial wipes laundering (ibid, p. 3-10).

(5) Additional descriptive information about industrial laundries is available from the USEPA report: "Technical Development Document for the Final Action Regarding Pretreatment Standards for the Industrial Laundries Point Source Category", EPA-821-R-00-006, March 2000, pp. 4-7 to 4-11, http://www.epa.gov/ost/guide/laundry/final/section1.pdf.

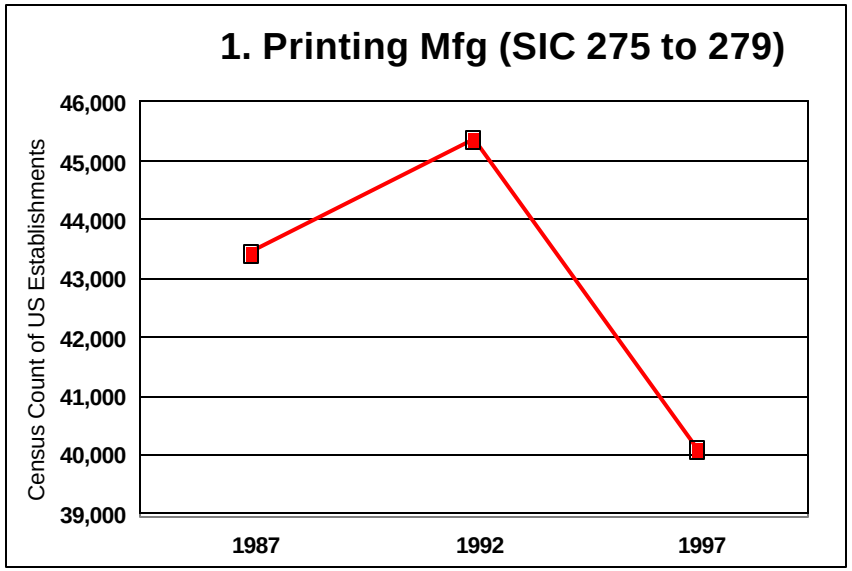
US CENSUS ESTABLISHMENTS 1987 - 1997
SUB-SECTORS WHICH USE INDUSTRIAL WIPES (with or without solvents)

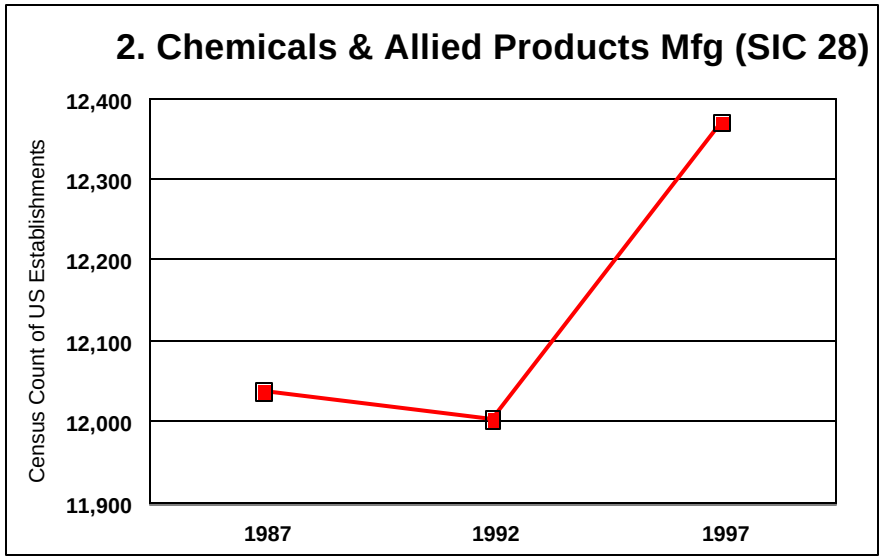
Item	Sub-sector	Sub-sector SIC codes	Component SIC codes	Count of Establishments*			Average annual 10-year change	Implied update multiplier 1997-2001
				1987	1992	1997		
1	Printing	275 to 279	Subtotal =	43,452	45,374	40,123	-0.79%	0.969
			275	36,111	38,441	34,000		
			276	856	921	922		
			277	162	172	152		
			278	1,546	1,649	1,704		
			279	4,777	4,191	3,345		
2	Chemical & Allied Products	28		12,039	12,004	12,371	0.27%	1.011
3	Plastics & Rubber	30		14,589	15,842	16,892	1.48%	1.060
4	Fabricated Metal Products	34		36,092	36,429	37,985	0.51%	1.021
5	Industrial Machinery & Eqpt	352 to 356	Subtotal =	25,227	25,492	26,145	0.36%	1.014
			352	1,799	1,774	1,656		
			353	3,473	3,341	3,523		
			354	11,446	11,506	11,706		
			355	4,557	4,739	4,781		
			356	3,952	4,132	4,479		
6	Electronics & Computers	367		5,836	6,655	6,605	1.25%	1.051
7	Transportation Eqpt	37		10,505	11,287	12,387	1.66%	1.068
8	Furniture & Fixtures	25		11,636	11,658	12,095	0.39%	1.016
9	Auto Dealers (retail trade)	5511+5521	Subtotal =	43,268	43,052	49,237	1.30%	1.053
			5511	28,320	24,380	25,897		
			5521	14,948	18,672	23,340		
10	Publishing (printed matter)	271 to 274	Subtotal =	18,339	20,018	22,332	1.99%	1.082
			271	9,091	8,668	8,773		
			272	4,020	4,700	6,331		
			273	2,859	3,265	3,693		
			274	2,369	3,385	3,535		
11	Business services (copy shops)	7334		4,474	4,949	5,780	2.59%	1.108
12	Auto Repair & Maintenance	753		114,601	128,738	142,372	2.19%	1.091
13	Military Bases	9721		622	601	580	-0.70%	0.972
			Printer subtotal (items 1+10+11) =	66,265	70,341	68,235	0.29%	1.012
			Non-printer subtotal =	274,415	291,758	316,669	1.44%	1.059
			Totals =	340,680	362,099	384,904	1.23%	1.050

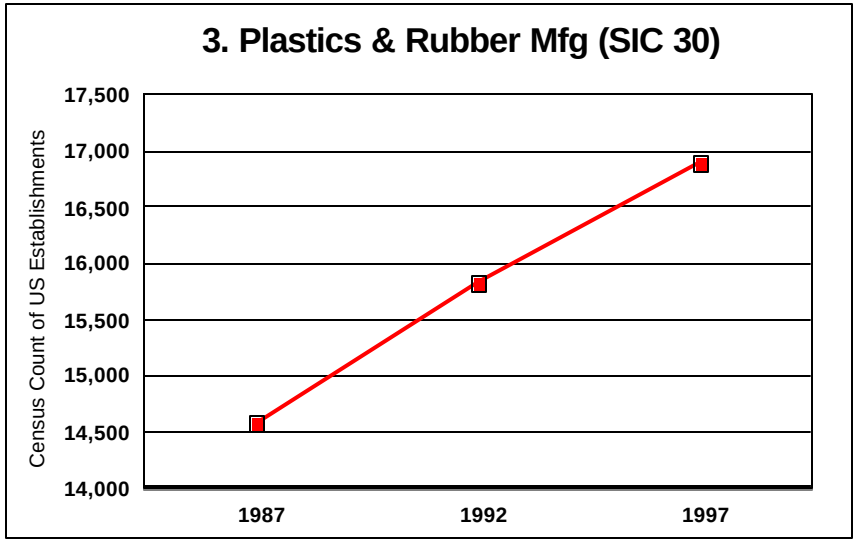
* Data sources:
Items 1 to 12: 1997 & 1992 data: http://www.census.gov/epcd/ec97sic/E97SUS.HTM
1987 data: provided to USEPA-OSWER-OSW-EMRAD by Mr. Paul Zeisset, Economist, US Bureau of Census (301-457-4151).
Item 13: http://www.defenselink.mil/pubs/installations/index.html and http://www.defenselink.mil/faq/pis/17.html

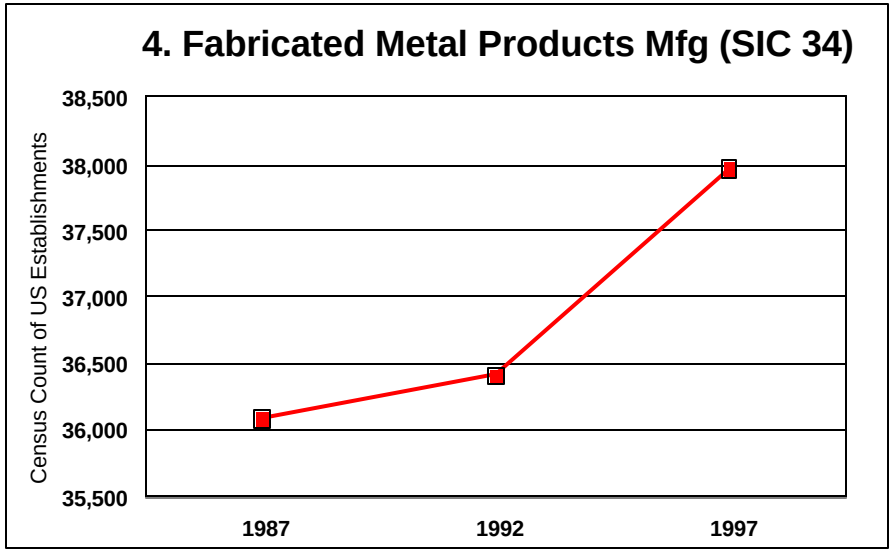
1997 ECONOMIC CENSUS DATA: FIRM & ESTABLISHMENT SIZE for the SOLID WASTE MANAGEMENT SUB-SECTOR								
I. NON-HAZARDOUS SOLID WASTE INDUSTRIES:								
Item	NAICS Code >	562111	562212	562213	562219	56292	Row totals	% of total
A. Economic Characteristics:								
1	Count of establishments (facilities)	7,083	1,403	105	294	765	9,650	100%
2	Count of companies (firms)	6,045	964	80	225	697	8,011	100%
3	Count of establishment employees	137,049	27,454	2,976	5,082	10,846	183,407	100%
4	Establishment 1997 receipts ($1,000)	$18,211,495	$5,493,433	$1,128,551	$751,028	$1,299,033	$26,883,540	100%
B. Establishment Size:								
General (uniform) small size benchmarks:								
5	Count of establishments w<20 employees	5,359	1,013	60	215	586	7,233	75.0%
6	Count of companies w/<500 employees	6,031	956	79	221	696	7,982	99.6%
7	Subtotal revenues if <500 employees ($1,000)	$7,618,106	$2,056,529	$292,712	$369,986	$1,048,609	$11,385,942	42.4%
Medium- and large-size benchmark:								
8	Count of estbl w/$10 million+ receipts	530	175	29	25	25	784	8.1%
9	Receipts of estbl w/$10 million+ ($1,000)	$10,483,376	$3,283,716	$980,469	$420,622	$461,977	$15,630,161	58.1%
10	Count of companies w/$10 million+	252	55	14	16	19	356	4.4%
11	Count of estb. w/companies $10million+	1,198	517	39	79	71	1,904	19.7%
12	Receipts of estb w/cos. $10 million+ ($1,000)	$13,115,703	$4,473,886	$1,085,905	$612,782	$601,474	$19,889,750	74.0%
SBA small size standard:								
13	Count of small companies <$10million	5,793	909	66	209	678	7,655	**95.6%**
14	Count of small company establishments	5,885	886	66	215	694	7,746	**80.3%**
II. HAZARDOUS SOLID WASTE INDUSTRIES:								
Item	NAICS Code >	562112	562211	Row totals	% of total			
A. Economic Characteristics:								
1	Count of establishments (facilities)	414	512	926	100%			
2	Count of companies (firms)	341	362	703	100%			
3	Count of establishment employees	8,468	17,816	26,284	100%			
4	Establishment 1997 receipts ($1,000)	$1,095,553	$2,877,982	$3,973,535	100%			
B. Establishment Size:								
General (uniform) small size benchmarks:								
5	Count of establishments w<20 employees	299	299	598	64.6%			
6	Count of companies w/<500 employees	337	357	695	98.8%			
7	Subtotal revenues if <500 employees ($1,000)	$826,136	$1,929,301	$2,755,437	69.3%			
Medium- and large-size benchmark:								
8	Count of estbl w/$10 million+ receipts	24	99	123	13.3%			
9	Receipts of estbl w/$10 million+ ($1,000)	$538,387	$2,040,079	$2,578,466	64.9%			
10	Count of companies w/$10 million+	30	60	90	12.8%			
11	Count of estb. w/companies $10million+	94	204	298	32.2%			
12	Receipts of estb w/cos. $10 million+ ($1,000)	$840,566	$2,392,606	$3,233,172	81.4%			
SBA small size standard:								
13	Count of small companies <$10million	311	302	613	**87.2%**			
14	Count of small company establishments	320	308	628	**67.8%**			

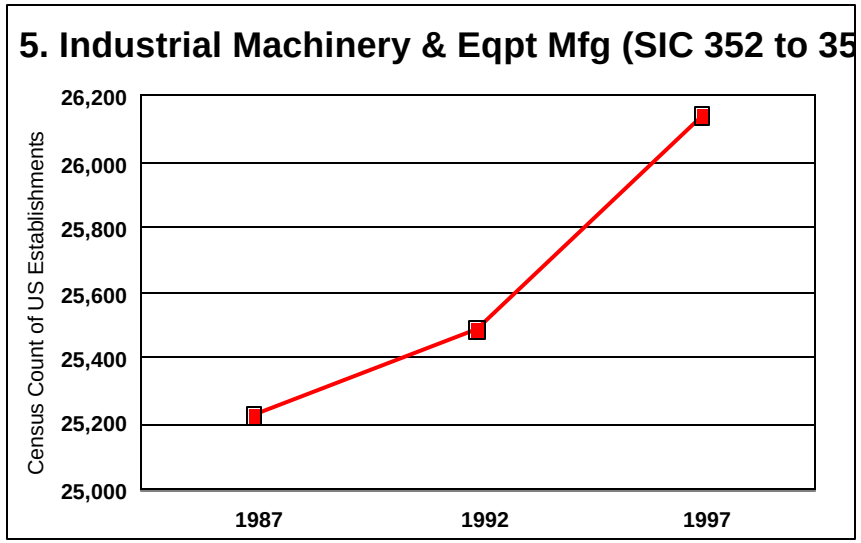
Source: US Dept of Commerce Bureau of Census, "1997 Economic Census: Establishment and Firm Size -- Administrative Support and Waste Management & Remediation Services", Oct 2000, http://www.census.gov/prod/ec97/97s56-sz.pdf

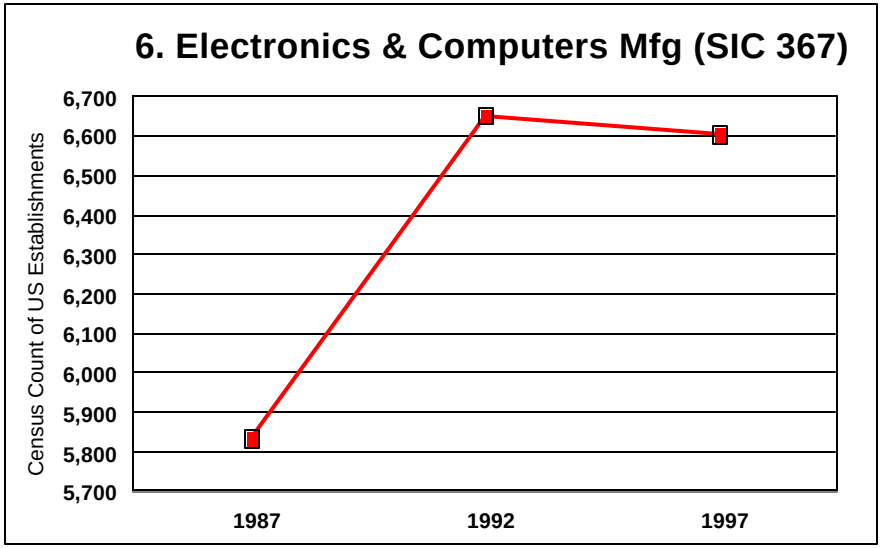

1. Printing Mfg (SIC 275 to 279)
Census Count of US Establishments
46,000
45,000
44,000
43,000
42,000
41,000
40,000
39,000
1987
1992
1997

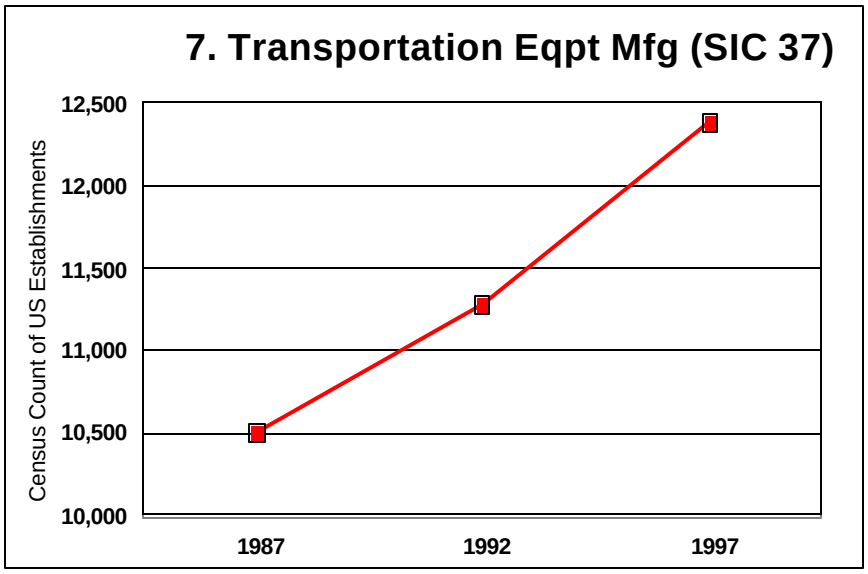

2. Chemicals & Allied Products Mfg (SIC 28)
Census Count of US Establishments
12,400
12,300
12,200
12,100
12,000
11,900
1987
1992
1997

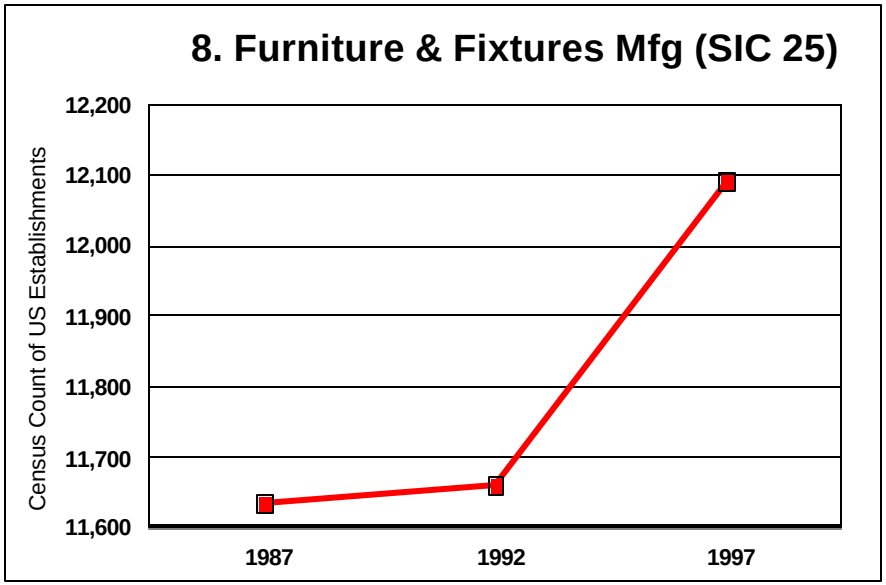

3. Plastics & Rubber Mfg (SIC 30)
Census Count of US Establishments
17,500
17,000
16,500
16,000
15,500
15,000
14,500
14,000
1987
1992
1997


4. Fabricated Metal Products Mfg (SIC 34)
Census Count of US Establishments
38,500
38,000
37,500
37,000
36,500
36,000
35,500
1987
1992
1997

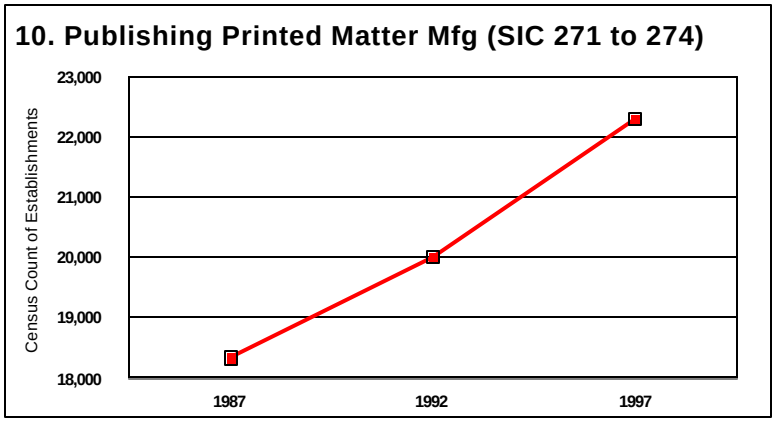

5. Industrial Machinery & Eqpt Mfg (SIC 352 to 35
Census Count of US Establishments
26,200
26,000
25,800
25,600
25,400
25,200
25,000
1987
1992
1997

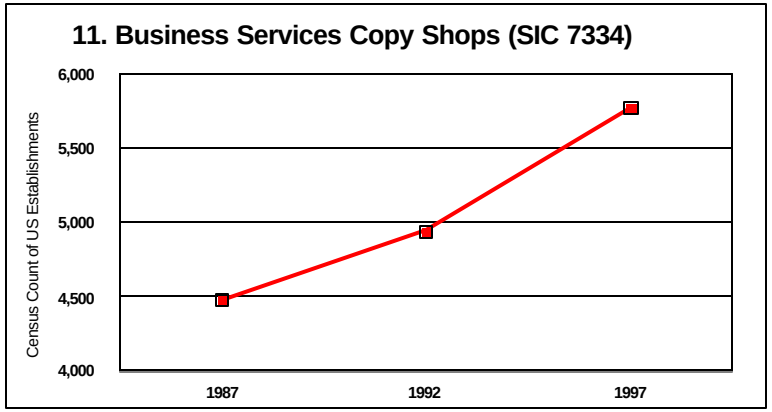

6. Electronics & Computers Mfg (SIC 367)
Census Count of US Establishments
6,700
6,600
6,500
6,400
6,300
6,200
6,100
6,000
5,900
5,800
5,700
1987
1992
1997

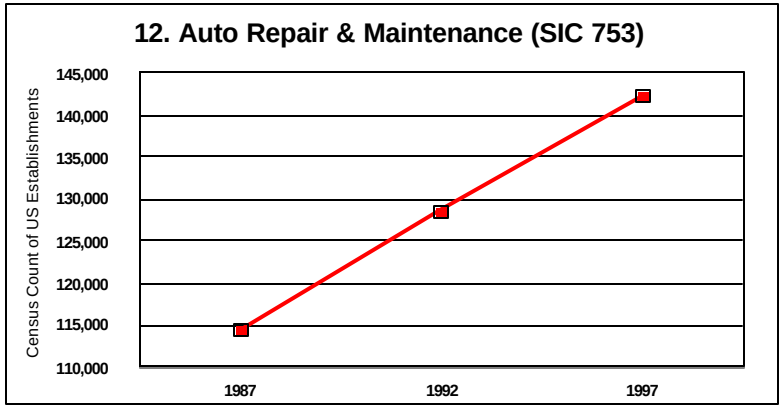

7. Transportation Eqpt Mfg (SIC 37)
Census Count of US Establishments
12,500
12,000
11,500
11,000
10,500
10,000
1987
1992
1997

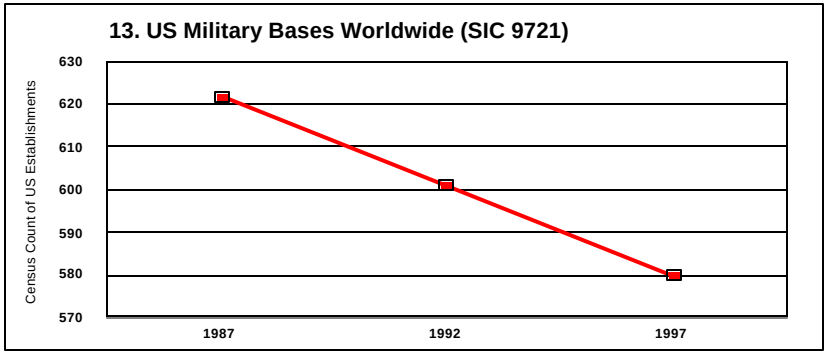

8. Furniture & Fixtures Mfg (SIC 25)
Census Count of US Establishments
12,200
12,100
12,000
11,900
11,800
11,700
11,600
1987
1992
1997


9. Auto Dealers Retail Trade (SIC 5511+5521)
Census Count of US Establishments
50,000
49,000
48,000
47,000
46,000
45,000
44,000
43,000
42,000
1987
1992
1997


10. Publishing Printed Matter Mfg (SIC 271 to 274)
Census Count of Establishments
23,000
22,000
21,000
20,000
19,000
18,000
1987
1992
1997


11. Business Services Copy Shops (SIC 7334)
Census Count of US Establishments
6,000
5,500
5,000
4,500
4,000
1987
1992
1997

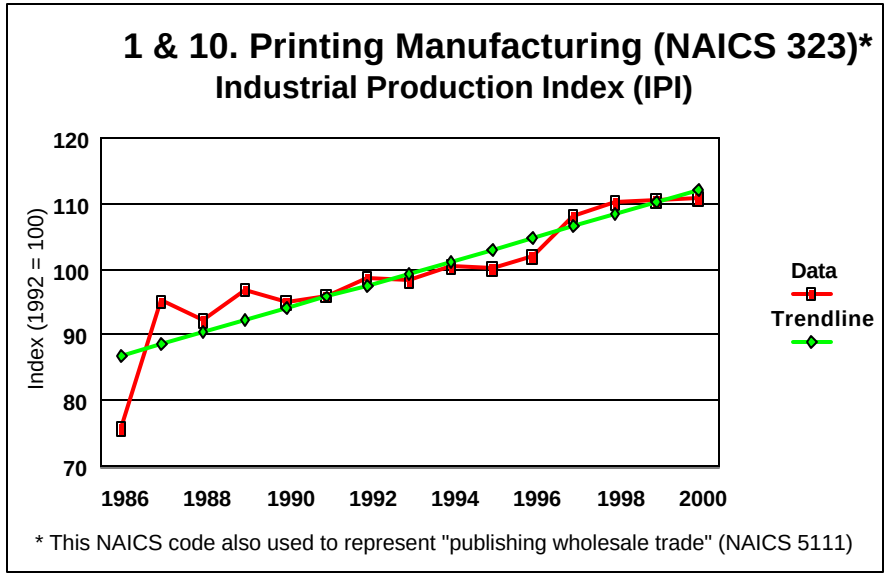

12. Auto Repair & Maintenance (SIC 753)
Census Count of US Establishments
145,000
140,000
135,000
130,000
125,000
120,000
115,000
110,000
1987
1992
1997

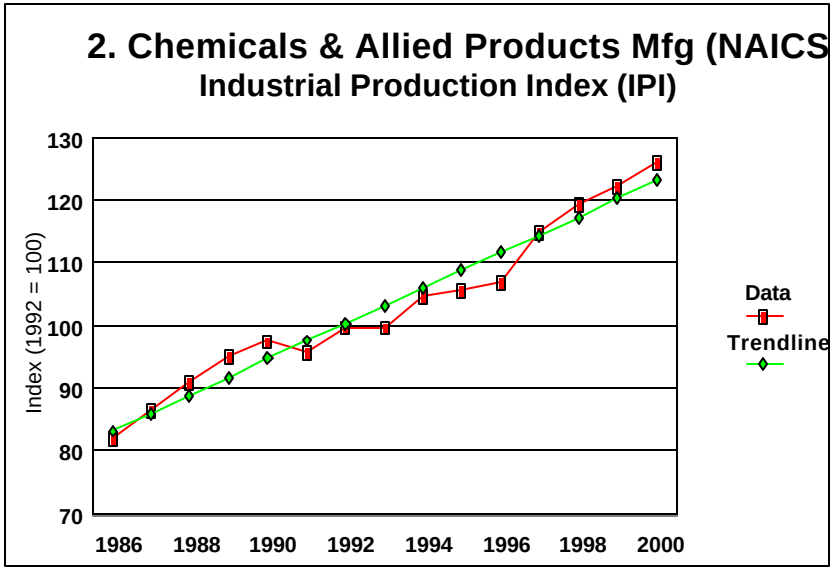

13. US Military Bases Worldwide (SIC 9721)
Census Count of US Establishments
630
620
610
600
590
580
570
1987
1992
1997

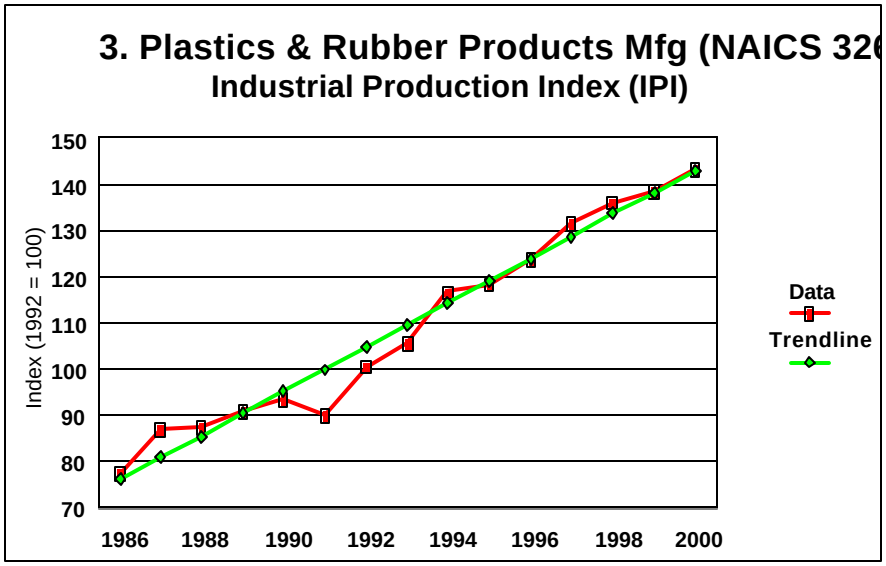
DERIVATION OF INDUSTRIAL WIPES
ANNUAL QUANTITY UPDATE MULTIPLIER
FOR UPDATE OF 1997 REFERENCE DATA
TO YEAR 2001

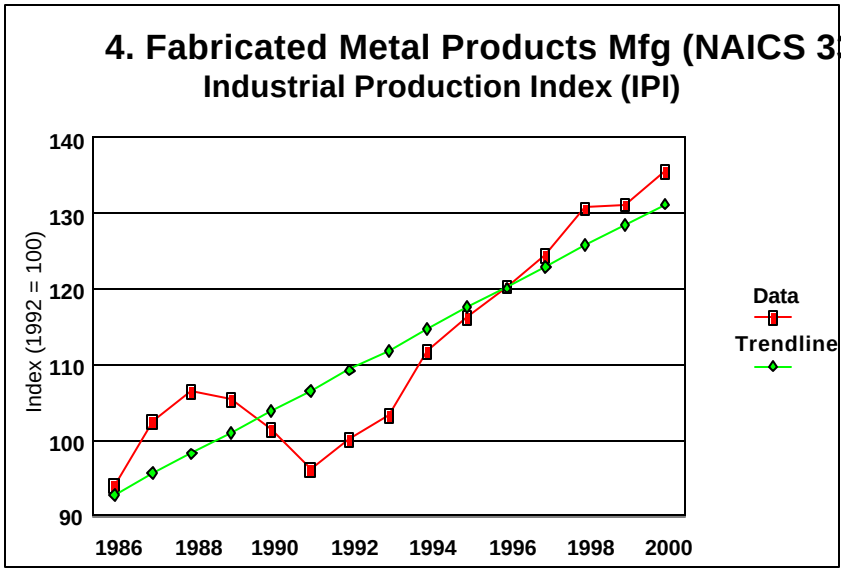
Item	Sub-sector	Census SIC code	Census NAICS code	1997 NAICS count of establish-ments	Industrial Production Index (IPI)			
					1986-2000 average annual growth in IPI end-points	1986-2000 annual IPI growth regression smoothed	Implied 1997 to 2001 update multiplier multiplier	
1	Printing	275 to 279	323	42,916	2.55%	1.71%	1.070	
2	Chemical & Allied Products	28	325	13,513	2.90%	2.64%	1.110	
3	Plastics & Rubber	30	326	16,876	4.20%	4.31%	1.184	
4	Fabricated Metal Products	34	332	62,501	2.48%	2.34%	1.097	
5	Industrial Machinery & Eqpt	352 to 356	333	30,665	7.81%	8.81%	1.402	
6	Electronics & Computers	367	3344	6,270	28.88%	28.88%	2.759	
7	Transportation Eqpt	37	336	12,980	2.35%	2.15%	1.089	
8	Furniture & Fixtures	25	337	20,758	2.88%	2.57%	1.107	
9	Auto Dealers (retail trade)	5511 & 5521	4411	49,237	2.35%	2.15%	1.089	
10	Publishing (printed matter)	271 to 274	5111	21,806	2.55%	1.71%	1.070	
11	Business services (copy shops)	7334	561439	5,780	1.87%	1.33%	1.054	
12	Auto Repair & Maintenance	753	8111	164,360	2.35%	2.15%	1.089	
13	Military Bases	9721	92812	588	5.27%	5.06%	1.218	<Avg 1 to 12
			Printer subtotal (items 1+10+11) =	70,502	2.50%	1.68%	1.069	
			Non-printer subtotal =	377,748	3.39%	3.31%	1.139	
			Total =	448,250	3.25%	3.05%	1.128	

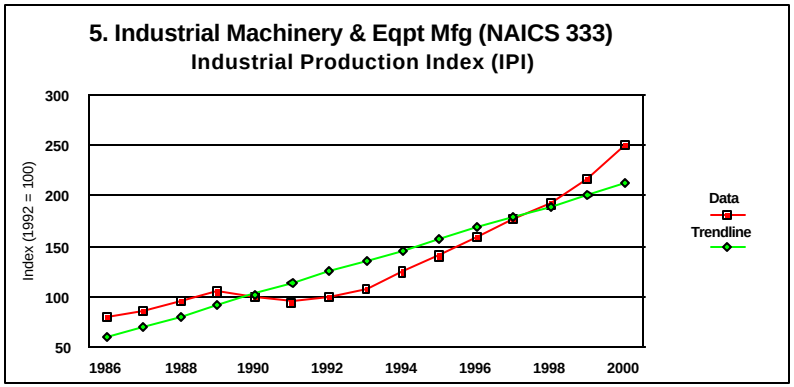
IPI data source: http://www.federalreserve.gov/releases/G17/table1_2.htm

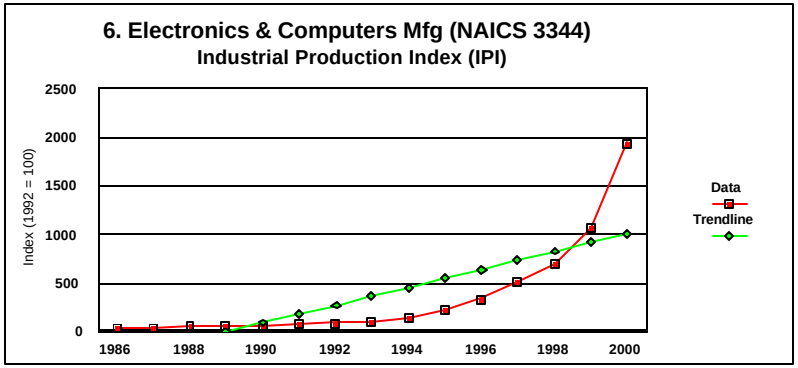

1 & 10. Printing Manufacturing (NAICS 323)*
Industrial Production Index (IPI)
Index (1992 = 100)
120
110
100
90
80
70
1986
1988
1990
1992
1994
1996
1998
2000
Data
Trendline
* This NAICS code also used to represent "publishing wholesale trade" (NAICS 5111)

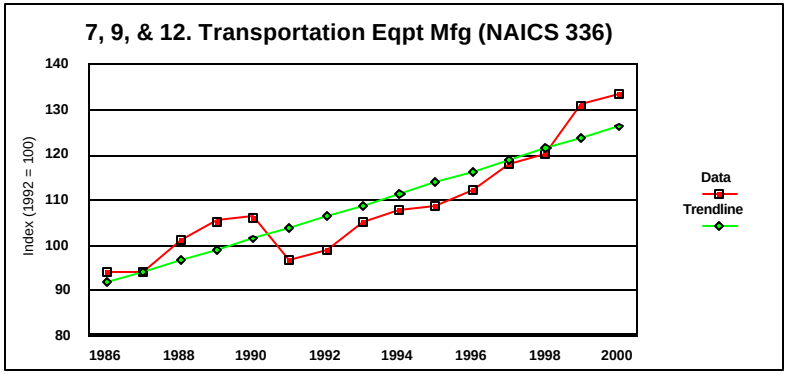

2. Chemicals & Allied Products Mfg (NAICS
Industrial Production Index (IPI)
Index (1992 = 100)
130
120
110
100
90
80
70
1986
1988
1990
1992
1994
1996
1998
2000
Data
Trendline

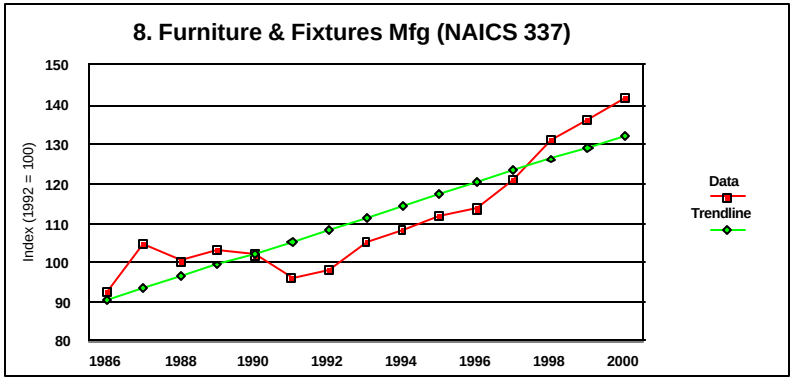

3. Plastics & Rubber Products Mfg (NAICS 32
Industrial Production Index (IPI)
Index (1992 = 100)
150
140
130
120
110
100
90
80
70
1986
1988
1990
1992
1994
1996
1998
2000
Data
Trendline

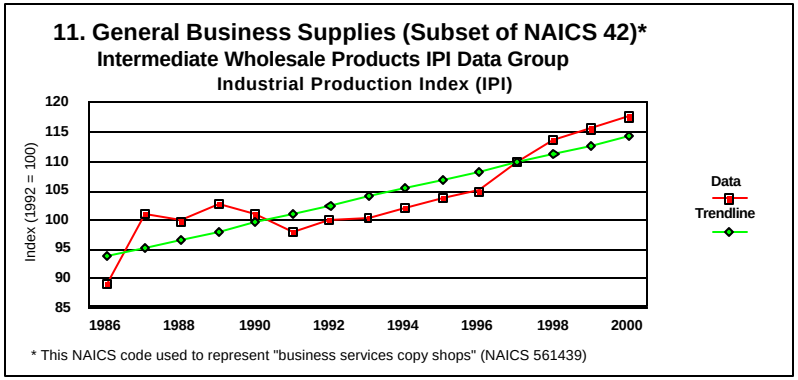

4. Fabricated Metal Products Mfg (NAICS 3
Industrial Production Index (IPI)
Index (1992 = 100)
140
130
120
110
100
90
1986
1988
1990
1992
1994
1996
1998
2000
Data
Trendline


5. Industrial Machinery & Eqpt Mfg (NAICS 333)
Industrial Production Index (IPI)
Index (1992 = 100)
300
250
200
150
100
50
1986
1988
1990
1992
1994
1996
1998
2000
Data
Trendline


6. Electronics & Computers Mfg (NAICS 3344)
Industrial Production Index (IPI)
Index (1992 = 100)
2500
2000
1500
1000
500
0
1986
1988
1990
1992
1994
1996
1998
2000
Data
Trendline


7, 9, & 12. Transportation Eqpt Mfg (NAICS 336)
Index (1992 = 100)
140
130
120
110
100
90
80
1986
1988
1990
1992
1994
1996
1998
2000
Data
Trendline


8. Furniture & Fixtures Mfg (NAICS 337)
Index (1992 = 100)
150
140
130
120
110
100
90
80
1986
1988
1990
1992
1994
1996
1998
2000
Data
Trendline


11. General Business Supplies (Subset of NAICS 42)*
Intermediate Wholesale Products IPI Data Group
Industrial Production Index (IPI)
Index (1992 = 100)
120
115
110
105
100
95
90
85
1986
1988
1990
1992
1994
1996
1998
2000
Data
Trendline
* This NAICS code used to represent "business services copy shops" (NAICS 561439)

INDUSTRIAL PRODUCTION INDEX (IPI) 1978-1993 Seasonally Adjusted IPI Historical Data (1992 = 100):												
SIC codes>	274-6,8,9	28	30	34	35	367	37	25	S54003	Avg*	Facility weighted average	Percent annual change
Sub-sector items> Year	1, 10	2	3	4	5	6	7, 9, 12	8	11	13		
1978	54.031	77.479	59.475	97.988	63.252	11.969	77.265	80.651	72.125	66.026	74.351	Base
1979	56.796	79.728	56.998	102.335	71.223	15.425	80.389	79.606	74.666	68.574	77.492	4.2%
1980	54.730	72.931	47.285	89.632	68.339	17.748	67.433	77.087	70.910	62.899	67.961	-12.3%
1981	58.152	79.289	58.299	93.380	76.645	21.108	69.590	80.237	75.200	67.989	71.495	5.2%
1982	63.011	70.996	57.081	85.948	65.737	26.333	66.133	74.003	75.599	64.982	68.156	-4.7%
1983	65.324	75.890	63.089	85.787	63.664	28.954	69.903	78.931	78.704	67.805	70.914	4.0%
1984	71.798	80.331	73.520	95.882	79.974	40.816	79.977	89.311	86.542	77.572	80.751	13.9%
1985	76.202	78.923	72.819	95.645	80.130	41.523	88.678	88.125	87.666	78.857	85.670	6.1%
1986	76.039	81.991	77.358	94.019	81.171	43.430	94.241	92.611	89.079	81.104	88.823	3.7%
1987	95.307	86.777	87.088	102.480	86.077	51.128	94.283	104.775	101.108	89.891	94.486	6.4%
1988	92.344	90.996	87.725	106.337	96.392	58.233	101.322	100.437	99.836	92.625	98.898	4.7%
1989	97.227	95.164	91.123	105.457	105.501	64.796	105.344	103.369	102.689	96.741	102.660	3.8%
1990	94.929	97.525	93.632	101.553	100.192	71.993	106.368	102.170	100.834	96.577	102.124	-0.5%
1991	96.238	95.854	90.291	96.008	95.244	79.578	96.939	96.173	97.972	93.811	96.043	-6.0%
1992	98.855	99.923	100.637	100.187	100.756	98.987	99.308	98.065	99.988	99.634	99.480	3.6%
1993	98.517	99.924	105.914	103.223	108.152	113.832	105.083	105.540	100.561	104.527	104.045	4.6%
1997 facilities>	64,722	13,513	16,876	62,501	30,665	6,270	226,577	20,758	5,780	580	448,242	

IPI data source: Federal Reserve (http://www.federalreserve.gov/releases/G17/table1_2.htm).
* Average of all other sectors used to represent SIC code 97 (sub-sector item 13)

EMPLOYMENT IN INDUSTRIES WHICH USE INDUSTRIAL WIPES
1978-1993 Seasonally Adjusted Historical Data (nr. workers x1,000):

SIC codes>	27	28	30	34	35	36	37	25	551	73	75	Avg*	Row totals	Percent annual change
Sub-sector items>	1, 10	2	3	4	5	6	7	8	9	11	12	13		
Year														
1978	1,196	1,096	796	1,662	2,340	1,694	1,970	495	841	2,173	551	No data	14,814	
1979	1,235	1,114	828	1,726	2,527	1,804	2,083	497	844	2,419	576	No data	15,653	5.7%
1980	1,251	1,107	737	1,571	2,513	1,746	1,819	455	728	2,538	571	No data	15,036	-3.9%
1981	1,264	1,114	777	1,601	2,529	1,778	1,910	470	708	2,696	567	No data	15,414	2.5%
1982	1,269	1,077	731	1,431	2,291	1,710	1,729	430	695	2,710	586	No data	14,659	-4.9%
1983	1,294	1,043	736	1,357	2,032	1,689	1,714	445	717	2,928	616	No data	14,571	-0.6%
1984	1,375	1,050	816	1,463	2,224	1,871	1,878	488	793	3,345	684	No data	15,987	9.7%
1985	1,425	1,045	815	1,465	2,204	1,863	1,958	491	855	3,664	727	No data	16,512	3.3%
1986	1,453	1,021	820	1,424	2,080	1,772	1,999	498	892	3,943	759	No data	16,661	0.9%
1987	1,501	1,012	837	1,393	2,021	1,736	2,022	513	924	4,267	794	No data	17,020	2.2%
1988	1,543	1,059	867	1,431	2,085	1,763	2,035	525	959	4,615	831	No data	17,713	4.1%
1989	1,556	1,075	888	1,449	2,130	1,746	2,057	526	955	4,932	882	No data	18,196	2.7%
1990	1,572	1,087	893	1,426	2,100	1,679	2,027	509	928	5,161	917	No data	18,299	0.6%
1991	1,534	1,072	855	1,354	1,998	1,595	1,887	473	877	5,067	880	No data	17,592	-3.9%
1992	1,506	1,086	878	1,330	1,932	1,528	1,843	478	878	5,308	876	No data	17,643	0.3%
1993	1,517	1,082	909	1,333	1,927	1,521	1,745	486	905	5,715	927	No data	18,067	2.4%
1997 facilities>	64,722	13,513	16,876	62,501	30,665	6,270	12,980	20,758	49,237	5,780	164,360	580	448,242	

Employment data source: Bureau of Labor Statistics (http://www.bls.gov/webapps/legacy/cesbtab1.htm).
* Average of all other sectors used to represent SIC code 97 (sub-sector item 13)

SUB-SECTORS GENERATING RCRA SOLVENT INDUSTRIAL WIPES
ESTIMATION OF RCRA REGULATORY STATUS

Category	Item	Economic Sector	Sub-sector	Sub-sector Census SIC code	Sub-sector Census NAICS code	1997 NAICS count of sub-sector estblshmts	RCRA Regulatory Status			Subtotal SQGs + LQGs
							CESQGs	SQGs**	LQGs*	
A. 1997 ESTIMATE OF ESTABLISHMENTS WHICH USE INDUSTRIAL WIPES (with & w/out solvents):										
Printers>	1	Manufacturing	Printing	275 to 279	323	42,916	0	42,325	591	42,916
Non-printers>	2	Manufacturing	Chemical & Allied Products	28	325	13,513	6,328	6,328	858	7,186
Non-printers>	3	Manufacturing	Plastics & Rubber	30	326	16,876	8,117	8,117	642	8,759
Non-printers>	4	Manufacturing	Fabricated Metal Products	34	332	62,501	30,581	30,581	1,339	31,920
Non-printers>	5	Manufacturing	Industrial Machinery & Eqpt	352 to 356	333	30,665	15,186	15,186	294	15,480
Non-printers>	6	Manufacturing	Electronics & Computers	367	3344	6,270	2,805	2,805	661	3,466
Non-printers>	7	Manufacturing	Transportation Eqpt	37	336	12,980	6,009	6,009	963	6,972
Non-printers>	8	Manufacturing	Furniture & Fixtures	25	337	20,758	10,270	10,270	219	10,489
Non-printers>	9	Retail Trade	Auto Dealers (retail trade)	5511+5521	4411	49,237	23,909	23,909	1,420	25,328
Printers>	10	Information	Publishing (printed matter)	271 to 274	5111	21,806	0	21,457	349	21,806
Printers>	11	Administrative Services	Business services (copy shops)	7334	561439	5,780	0	5,665	115	5,780
Non-printers>	12	Other Services	Auto Repair & Maintenance	753	8111	164,360	82,151	82,151	59	82,210
Non-printers>	13	Public Administration	Military Bases	9721	92812	580	243	243	95	338
					Column Totals:	448,242	185,595	255,042	7,604	**262,647**
						100.0%	41.4%	56.9%	1.7%	58.6%
					Subtotals:	All NAICS	CESQGs	SQGs	LQGs	SQG+LQG
					Printers>	70,502	0	69,447	1,055	70,502
					Non-printers>	377,740	185,595	185,595	6,550	192,145

B. 1997 ESTIMATE OF RCRA SOLVENT WASTE INDUSTRIAL WIPES GENERATORS:

Category	Item	Economic Sector	Sub-sector	% facilities using solvent wipes	% states assumed adopting rule	Total applicable facilities	RCRA Regulatory Status			Subtotal SQGs + LQGs
							CESQGs	SQGs**	LQGs*	
Printers>	1	Manufacturing	Printing	100%	75%	32,187	0	31,744	443	32,187
Non-printers>	2	Manufacturing	Chemical & Allied Products	35%	75%	3,547	1,661	1,661	225	1,886
Non-printers>	3	Manufacturing	Plastics & Rubber	35%	75%	4,430	2,131	2,131	169	2,299
Non-printers>	4	Manufacturing	Fabricated Metal Products	35%	75%	16,407	8,028	8,028	351	8,379
Non-printers>	5	Manufacturing	Industrial Machinery & Eqpt	35%	75%	8,050	3,986	3,986	77	4,063
Non-printers>	6	Manufacturing	Electronics & Computers	35%	75%	1,646	736	736	174	910
Non-printers>	7	Manufacturing	Transportation Eqpt	35%	75%	3,407	1,577	1,577	253	1,830
Non-printers>	8	Manufacturing	Furniture & Fixtures	35%	75%	5,449	2,696	2,696	57	2,753
Non-printers>	9	Retail Trade	Auto Dealers (retail trade)	35%	75%	12,925	6,276	6,276	373	6,649
Printers>	10	Information	Publishing (printed matter)	100%	75%	16,355	0	16,093	262	16,355
Printers>	11	Administrative Services	Business services (copy shops)	100%	75%	4,335	0	4,249	86	4,335
Non-printers>	12	Other Services	Auto Repair & Maintenance	35%	75%	43,145	21,565	21,565	15	21,580
Non-printers>	13	Public Administration	Military Bases	35%	75%	152	64	64	25	89

Category	Item	Economic Sector	Sub-sector	% facilities using solvent wipes	% states assumed adopting rule	Total applicable facilities	RCRA Regulatory Status			Subtotal SQGs + LQGs
							CESQGs	SQGs**	LQGs*	
					Column Totals:	152,033	48,719	100,804	2,510	**103,315**
						100.0%	32.0%	66.3%	1.7%	68.0%
					Subtotals:	All NAICS	CESQGs	SQGs	LQGs	SQG+LQG
					Printers>	52,877	0	52,085	791	52,877
					Non-printers>	99,157	48,719	48,719	1,719	50,438

Explanatory Notes:

(a) RCRA Regulatory Status Definitions for Establishments (i.e. establishment size classes):

- CESQGs = conditionally exempt small quantity generator <100 kilograms (220.5 pounds) haz waste in a calendar month (40 CFR 261.5(a)).
- SQGs = small quantity generator <1,000 kilograms (2,205 pounds) haz waste in a calendar month (40 CFR 261.10).
- LQGs = large quantity generator >1,000 kilograms (2,205 pounds) haz waste in a calendar month (not defined in 40 CFR).

(b) Size Class Estimation Methodology:

* LQGs assigned based on count from 1995 USEPA "Biennial Reporting System" (BRS) database of RCRA hazardous waste LQGs.

Shaded cells proportionally assigned by OSW-EMRAD in absence of BRS data, according to LQG proportion from SAIC-NEMC = 2.1%

** SQGs assumed to represent following percentage of all facilities in each sub-sector, after subtracting LQGs:

- Printer sub-sectors (items 1, 10, 11) = 98.5%
- Non-printer sub-sectors = 50.0%

CESQGs estimated as remainder of facilities, after subtracting LQGs and SQGs, from 1997 NAICS Census totals in each sub-sector.

(c) Data sources for total establishment counts in each sub-sector:

1997 NAICS code establishment count for manufacturing sub-sectors: http://www.census.gov/epcd/ec97.

1995 benchmark year count of US military bases (worldwide installations, major, minor, other): http://www.defenselink.mil/pubs/installations/index.html.

- NAICS = North American Industrial Classification system (http://www.census.gov/epcd/www/naics.html).
- SIC = Standard Industrial Classification system.

ESTABLISHMENTS USING INDUSTRIAL WIPES WITH & WITHOUT SOLVENTS
BY SUB-SECTOR & BY TYPE OF INDUSTRIAL WIPES

A. 1997 REFERENCE DATA:

		RCRA Regulatory Status>>>	CESQGs (nr. establishments)			SQGs (nr. establishments)			LQGs (nr. establishments)			Total establishments		
	Item	Sub-sector	Reusables	Disposables	Subtotal	Reusables	Disposables	Subtotal	Reusables	Disposables	Subtotal	Reusables	Disposables	Totals
Printer>	1	Printing	0	0	0	39,355	2,970	42,325	550	41	591	39,904	3,012	42,916
Non-printer>	2	Chemical & Allied Products	5,883	444	6,328	5,883	444	6,328	798	60	858	12,565	948	13,513
Non-printer>	3	Plastics & Rubber	7,547	570	8,117	7,547	570	8,117	597	45	642	15,692	1,184	16,876
Non-printer>	4	Fabricated Metal Products	28,435	2,146	30,581	28,435	2,146	30,581	1,245	94	1,339	58,115	4,386	62,501
Non-printer>	5	Industrial Machinery & Eqpt	14,120	1,066	15,186	14,120	1,066	15,186	273	21	294	28,513	2,152	30,665
Non-printer>	6	Electronics & Computers	2,608	197	2,805	2,608	197	2,805	615	46	661	5,830	440	6,270
Non-printer>	7	Transportation Eqpt	5,587	422	6,009	5,587	422	6,009	895	68	963	12,069	911	12,980
Non-printer>	8	Furniture & Fixtures	9,549	721	10,270	9,549	721	10,270	204	15	219	19,301	1,457	20,758
Non-printer>	9	Auto Dealers (retail trade)	22,231	1,678	23,909	22,231	1,678	23,909	1,320	100	1,420	45,781	3,456	49,237
Printer>	10	Publishing (printed matter)	0	0	0	19,951	1,506	21,457	324	24	349	20,276	1,530	21,806
Printer>	11	Business services (copy shops)	0	0	0	5,267	398	5,665	107	8	115	5,374	406	5,780
Non-printer>	12	Auto Repair & Maintenance	76,385	5,766	82,151	76,385	5,766	82,151	55	4	59	152,825	11,535	164,360
Non-printer>	13	Military Bases	225	17	243	225	17	243	88	7	95	539	41	580
		Totals =	172,570	13,026	185,595	237,143	17,899	255,042	7,071	534	7,604	416,783	31,459	448,242
					41.4%			56.9%			1.7%	93.0%	7.0%	100.0%
		Printer subtotal (items 1+10+11) =	0	0	0	64,573	4,874	69,447	981	74	1,055	65,554	4,948	70,502
		Non-printer subtotal =	172,570	13,026	185,595	172,570	13,026	185,595	6,090	460	6,550	351,229	26,511	377,740

B. UPDATE TO YEAR 2001:

		RCRA Regulatory Status>>>	CESQGs (nr. establishments)			SQGs (nr. establishments)			LQGs (nr. establishments)			Total establishments		
	Item	Sub-sector	Reusables	Disposables	Subtotal	Reusables	Disposables	Subtotal	Reusables	Disposables	Subtotal	Reusables	Disposables	Totals
Printer>	1	Printing	0	0	0	38,120	2,877	40,997	532	40	572	38,652	2,917	41,569
Non-printer>	2	Chemical & Allied Products	5,948	449	6,397	5,948	449	6,397	807	61	867	12,702	959	13,661
Non-printer>	3	Plastics & Rubber	8,003	604	8,607	8,003	604	8,607	633	48	681	16,639	1,256	17,895
Non-printer>	4	Fabricated Metal Products	29,022	2,191	31,213	29,022	2,191	31,213	1,271	96	1,367	59,315	4,477	63,792
Non-printer>	5	Industrial Machinery & Eqpt	14,323	1,081	15,404	14,323	1,081	15,404	277	21	298	28,923	2,183	31,107
Non-printer>	6	Electronics & Computers	2,740	207	2,947	2,740	207	2,947	646	49	695	6,126	462	6,588
Non-printer>	7	Transportation Eqpt	5,967	450	6,418	5,967	450	6,418	956	72	1,029	12,891	973	13,864
Non-printer>	8	Furniture & Fixtures	9,698	732	10,430	9,698	732	10,430	207	16	222	19,602	1,480	21,082
Non-printer>	9	Auto Dealers (retail trade)	23,410	1,767	25,177	23,410	1,767	25,177	1,390	105	1,495	48,210	3,639	51,849
Printer>	10	Publishing (printed matter)	0	0	0	21,587	1,629	23,216	351	26	377	21,938	1,656	23,594
Printer>	11	Business services (copy shops)	0	0	0	5,836	440	6,276	118	9	127	5,954	449	6,404
Non-printer>	12	Auto Repair & Maintenance	83,311	6,288	89,599	83,311	6,288	89,599	60	5	64	166,682	12,581	179,263
Non-printer>	13	Military Bases	219	17	236	219	17	236	86	6	92	524	40	564
		Totals =	182,642	13,786	196,427	248,184	18,733	266,917	7,334	554	7,888	438,160	33,072	471,232
					41.7%			56.6%			1.7%	93.0%	7.0%	100.0%
		Printer subtotal (items 1+10+11) =	0	0	0	65,542	4,947	70,489	1,002	76	1,077	66,544	5,023	71,567
		Non-printer subtotal =	182,642	13,786	196,427	182,642	13,786	196,427	6,332	478	6,810	371,616	28,049	399,665

MOST-LIKELY ESTIMATE
SUB-SECTOR REFERENCE DATA UPDATED TO YEAR 2001

I. ESTABLISHMENTS GENERATING RCRA SOLVENT WASTE INDUSTRIAL WIPES BY SUB-SECTOR & TYPE OF WIPES

	Item	RCRA Regulatory Status>>>	CESQGs (number of establishments)			SQGs (number of establishments)			LQGs (number of establishments)			TOTALS (CESQGs + SQGs + LQGs)			Subtotal Affected Entities (SQGs + LQGs)			1997 to 2001 multiplier
		Sub-sector	Reusables	Disposables	Subtotal	Reusables	Disposables	Subtotal	Reusables	Disposables	Subtotal	Reusables	Disposables	Totals	Reusables	Disposables	Totals	
Printer>	1	Printing	0	0	0	28,590	2,158	30,748	399	30	429	28,989	2,188	31,177	28,989	2,188	31,177	0.969
Non-printer>	2	Chemical & Allied Products	1,524	155	1,679	1,524	155	1,679	212	16	228	3,259	327	3,586	1,735	171	1,907	1.011
Non-printer>	3	Plastics & Rubber	2,050	209	2,259	2,050	209	2,259	166	13	179	4,267	431	4,697	2,216	222	2,438	1.060
Non-printer>	4	Fabricated Metal Products	7,435	758	8,193	7,435	758	8,193	334	25	359	15,204	1,541	16,745	7,769	783	8,552	1.021
Non-printer>	5	Industrial Machinery & Eqpt	3,669	374	4,044	3,669	374	4,044	73	5	78	7,412	754	8,165	3,742	380	4,122	1.014
Non-printer>	6	Electronics & Computers	702	72	774	702	72	774	170	13	182	1,573	156	1,729	872	84	956	1.051
Non-printer>	7	Transportation Eqpt	1,529	156	1,685	1,529	156	1,685	251	19	270	3,309	331	3,639	1,780	175	1,955	1.068
Non-printer>	8	Furniture & Fixtures	2,484	253	2,738	2,484	253	2,738	54	4	58	5,023	511	5,534	2,539	257	2,796	1.016
Non-printer>	9	Auto Dealers (retail trade)	5,998	611	6,609	5,998	611	6,609	365	28	392	12,360	1,250	13,610	6,362	639	7,001	1.053
Printer>	10	Publishing (printed matter)	0	0	0	16,190	1,222	17,412	263	20	283	16,453	1,242	17,695	16,453	1,242	17,695	1.082
Printer>	11	Business services (copy shops)	0	0	0	4,377	330	4,707	89	7	95	4,466	337	4,803	4,466	337	4,803	1.108
Non-printer>	12	Auto Repair & Maintenance	21,344	2,176	23,520	21,344	2,176	23,520	16	1	17	42,703	4,353	47,057	21,360	2,177	23,537	1.091
Non-printer>	13	Military Bases	56	6	62	56	6	62	23	2	24	135	13	148	79	7	86	0.972
		Totals =	46,792	4,770	51,562	95,948	8,481	104,429	2,413	182	2,596	145,154	13,433	**158,587**	98,362	8,663	**107,025**	1.043
					32.5%			65.8%			1.6%	91.5%	8.5%	100.0%			67.5%	
		Printer subtotal (items 1+10+11) =	0	0	0	49,157	3,710	52,867	751	57	808	49,908	3,767	53,675	49,908	3,767	53,675	50.2%
		Non-printer subtotal =	46,792	4,770	51,562	46,792	4,770	51,562	1,662	125	1,788	95,246	9,666	104,912	48,454	4,896	53,350	49.8%

II. ANNUAL NUMBER OF RCRA SOLVENT WASTE INDUSTRIAL WIPES GENERATED BY APPLICABLE ESTABLISHMENTS

	Item	RCRA Regulatory Status>>>	CESQGs (number of industrial wipes)			SQGs (number of industrial wipes)			LQGs (number of industrial wipes)			TOTALS (CESQGs + SQGs + LQGs)			Subtotal Affected Entities (SQGs + LQGs)			1997 to 2001 multiplier
		Sub-sector	Reusables	Disposables	Subtotal	Reusables	Disposables	Subtotal	Reusables	Disposables	Subtotal	Reusables	Disposables	Totals	Reusables	Disposables	Totals	
Printer>	1	Printing	0	0	0	565,659,591	17,050,706	582,710,298	74,303,831	2,237,036	76,540,867	639,963,423	19,287,742	659,251,165	639,963,423	19,287,742	659,251,165	1.070
Non-printer>	2	Chemical & Allied Products	12,053,232	1,908,983	13,962,216	42,186,313	6,670,343	48,856,656	23,718,009	2,774,685	26,492,694	77,957,554	11,354,012	89,311,565	65,904,321	9,445,028	75,349,349	1.110
Non-printer>	3	Plastics & Rubber	16,489,634	2,604,250	19,093,884	57,707,802	9,126,711	66,834,512	18,928,159	2,213,612	21,141,771	93,125,595	13,944,572	107,070,167	76,635,961	11,340,323	87,976,283	1.184
Non-printer>	4	Fabricated Metal Products	57,577,964	9,106,271	66,684,235	201,522,873	31,860,977	233,383,850	36,600,626	4,278,850	40,879,476	295,701,463	45,246,098	340,947,561	238,123,499	36,139,827	274,263,326	1.097
Non-printer>	5	Industrial Machinery & Eqpt	36,527,334	5,774,851	42,302,185	127,845,668	20,211,978	148,057,646	10,260,172	1,205,430	11,465,602	174,633,174	27,192,259	201,825,433	138,105,840	21,417,408	159,523,248	1.402
Non-printer>	6	Electronics & Computers	13,270,139	2,096,737	15,366,876	46,459,279	7,338,580	53,797,859	45,438,499	5,324,609	50,763,108	105,167,917	14,759,925	119,927,843	91,897,779	12,663,188	104,560,967	2.759
Non-printer>	7	Transportation Eqpt	11,226,160	1,774,844	13,001,004	39,297,004	6,217,398	45,514,402	26,121,783	3,059,700	29,181,483	76,644,947	11,051,942	87,696,889	65,418,787	9,277,098	74,695,885	1.089
Non-printer>	8	Furniture & Fixtures	19,502,346	3,088,056	22,590,402	68,269,281	10,791,594	79,060,874	6,043,292	708,371	6,751,664	93,814,920	14,588,021	108,402,940	74,312,573	11,499,965	85,812,538	1.107
Non-printer>	9	Auto Dealers (retail trade)	44,675,979	7,066,710	51,742,689	156,360,483	24,728,040	181,088,523	38,513,024	4,507,886	43,020,910	239,549,486	36,302,636	275,852,122	194,873,507	29,235,926	224,109,433	1.089
Printer>	10	Publishing (printed matter)	0	0	0	286,768,691	8,648,444	295,417,134	43,841,615	1,327,236	45,168,852	330,610,306	9,975,680	340,585,986	330,610,306	9,975,680	340,585,986	1.070
Printer>	11	Business services (copy shops)	0	0	0	74,581,196	2,245,659	76,826,855	14,233,053	432,263	14,665,316	88,814,248	2,677,922	91,492,171	88,814,248	2,677,922	91,492,171	1.054
Non-printer>	12	Auto Repair & Maintenance	153,507,666	24,270,718	177,778,385	537,276,832	84,952,959	622,229,791	1,600,626	185,106	1,785,733	692,385,125	109,408,784	801,793,908	538,877,458	85,138,065	624,015,523	1.089
Non-printer>	13	Military Bases	511,749	85,291	597,040	1,778,937	280,243	2,059,180	2,887,726	341,166	3,228,892	5,178,412	706,701	5,885,113	4,666,663	621,409	5,288,073	1.218
		Totals =	365,342,203	57,776,711	423,118,915	2,205,713,949	230,123,632	2,435,837,581	342,490,416	28,595,951	371,086,367	2,913,546,569	316,496,294	**3,230,042,863**	2,548,204,365	258,719,583	**2,806,923,948**	1.128
					13.1%			75.4%			11.5%	90.2%	9.8%	100.0%			86.9%	
		Printer subtotal (items 1+10+11) =	0	0	0	927,009,478	27,944,809	954,954,287	132,378,499	3,996,535	136,375,034	1,059,387,977	31,941,344	1,091,329,321	1,059,387,977	31,941,344	1,091,329,321	38.9%
		Non-printer subtotal =	365,342,203	57,776,711	423,118,915	1,278,704,471	202,178,823	1,480,883,294	210,111,917	24,599,416	234,711,333	1,854,158,592	284,554,950	2,138,713,542	1,488,816,388	226,778,238	1,715,594,627	61.1%

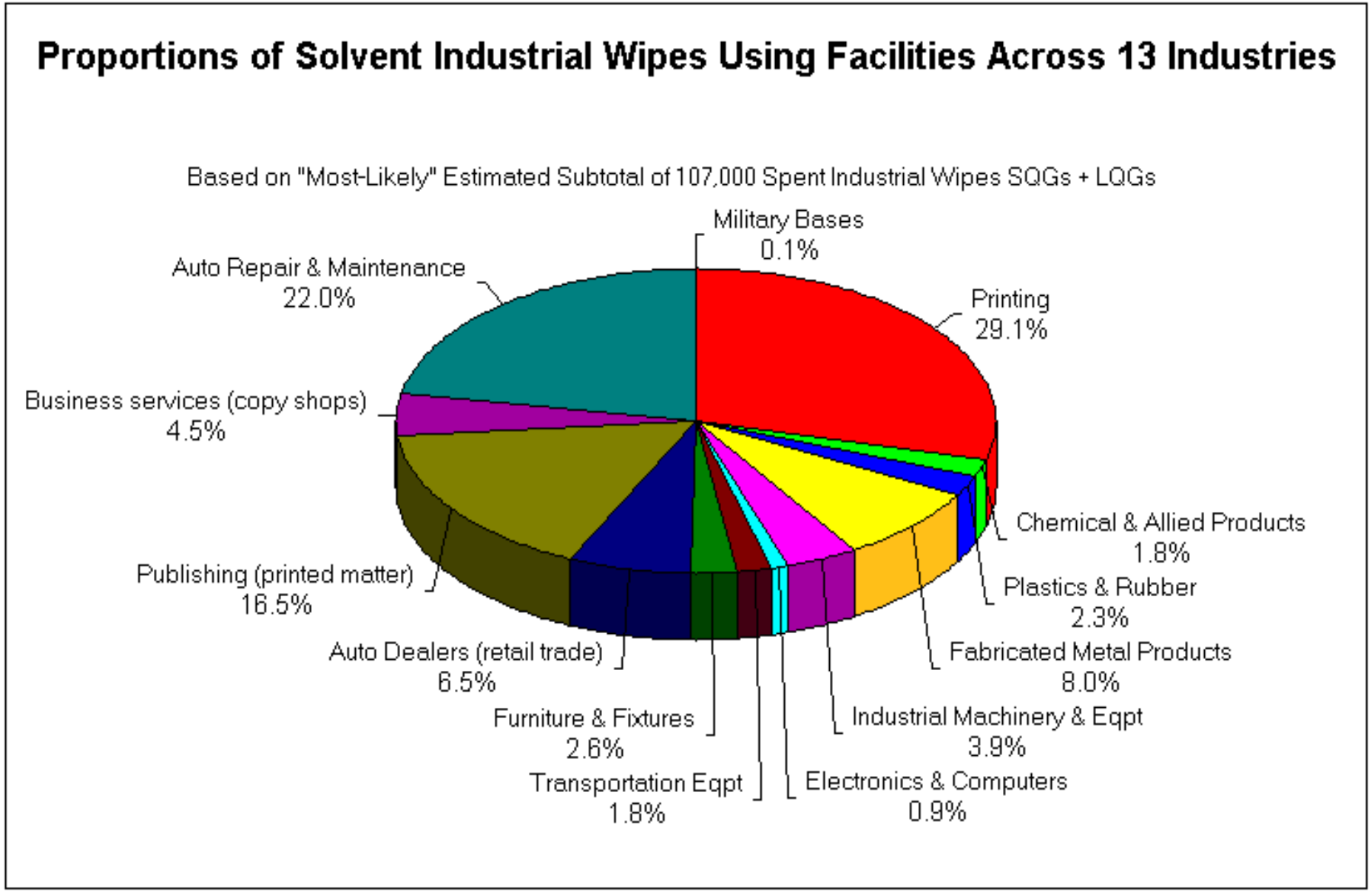
III. ANNUAL RCRA SOLVENT WASTE INDUSTRIAL WIPES GENERATED PER APPLICABLE ESTABLISHMENT

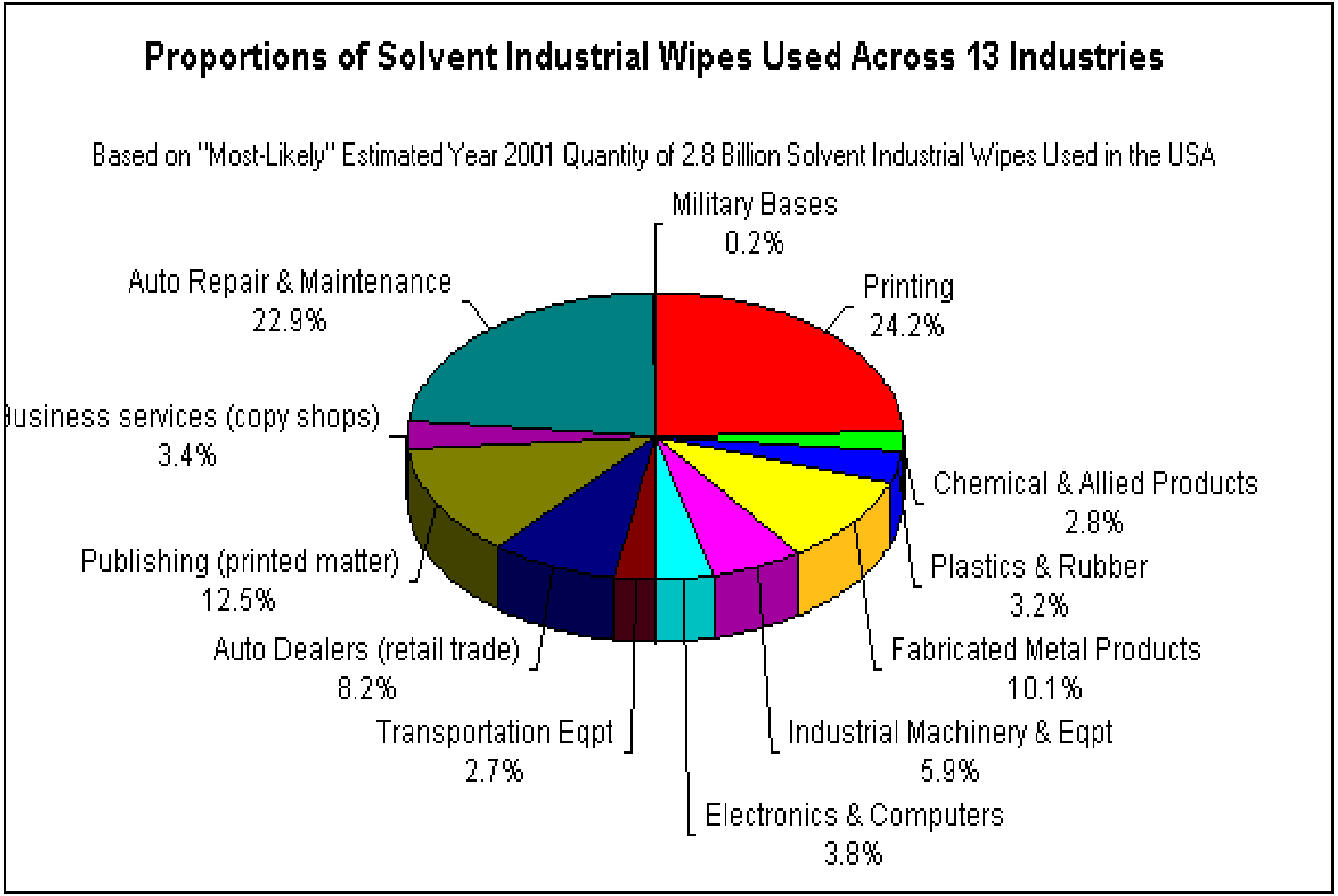
	Item	RCRA Regulatory Status>>>	CESQGs (wipes per establishment)			SQGs (wipes per establishment)			LQGs (wipes per establishment)			TOTALS (CESQGs + SQGs + LQGs)			Subtotal Affected Entities (SQGs + LQGs)		
		Sub-sector	Reusables	Disposables	Subtotal	Reusables	Disposables	Subtotal	Reusables	Disposables	Subtotal	Reusables	Disposables	Totals	Reusables	Disposables	Totals
Printer>	1	Printing	0	0	0	19,785	7,901	18,951	186,128	74,241	178,275	22,076	8,815	21,145	22,076	8,815	21,145
Non-printer>	2	Chemical & Allied Products	7,910	12,288	8,315	27,685	42,937	29,096	112,031	173,637	116,355	23,919	34,755	24,906	37,974	55,127	39,515
Non-printer>	3	Plastics & Rubber	8,042	12,459	8,451	28,146	43,661	29,581	113,916	176,501	118,308	21,825	32,383	22,793	34,575	51,180	36,084
Non-printer>	4	Fabricated Metal Products	7,744	12,013	8,139	27,103	42,031	28,485	109,724	169,945	113,950	19,449	29,357	20,361	30,651	46,143	32,070
Non-printer>	5	Industrial Machinery & Eqpt	9,954	15,436	10,462	34,840	54,027	36,615	140,952	219,396	146,457	23,562	36,078	24,717	36,904	56,421	38,702
Non-printer>	6	Electronics & Computers	18,904	29,297	19,865	66,183	102,540	69,547	268,036	416,127	278,429	66,838	94,657	69,346	105,447	150,103	109,388
Non-printer>	7	Transportation Eqpt	7,343	11,387	7,717	25,704	39,889	27,016	104,045	161,461	108,075	23,164	33,422	24,096	36,754	53,068	38,213
Non-printer>	8	Furniture & Fixtures	7,850	12,191	8,251	27,478	42,605	28,878	111,322	172,877	115,642	18,676	28,565	19,589	29,271	44,678	30,689
Non-printer>	9	Auto Dealers (retail trade)	7,449	11,557	7,829	26,071	40,441	27,400	105,542	163,666	109,621	19,381	29,032	20,268	30,629	45,753	32,009
Printer>	10	Publishing (printed matter)	0	0	0	17,712	7,077	16,966	166,605	66,822	159,602	20,094	8,033	19,247	20,094	8,033	19,247
Printer>	11	Business services (copy shops)	0	0	0	17,040	6,798	16,321	160,313	64,504	153,588	19,889	7,945	19,050	19,889	7,945	19,050
Non-printer>	12	Auto Repair & Maintenance	7,192	11,154	7,559	25,173	39,040	26,456	101,910	156,141	105,716	16,214	25,133	17,039	25,229	39,104	26,512
Non-printer>	13	Military Bases	9,110	14,893	9,645	31,668	48,934	33,266	128,071	200,461	133,151	38,388	53,718	39,750	59,281	83,648	61,382
		Totals =	7,808	12,111	8,206	22,989	27,135	23,325	141,912	156,980	142,969	20,072	23,560	20,368	25,906	29,865	26,227
		Printer average (items 1,10,11)=	0	0	0	18,858	7,532	18,063	176,237	70,491	168,816	21,227	8,479	20,332	21,227	8,479	20,332
		Non-printer average =	7,808	12,111	8,206	27,328	42,381	28,720	126,401	196,062	131,290	19,467	29,438	20,386	30,726	46,320	32,157

IV. WEEKLY SOLVENT INDUSTRIAL WIPES USAGE RATES PER ESTABLISHMENT

	Item	RCRA Regulatory Status>>>	CESQGs (wipes per establishment)			SQGs (wipes per establishment)			LQGs (wipes per establishment)			TOTALS (CESQGs + SQGs + LQGs)			Subtotal Affected Entities (SQGs + LQGs)		
		Sub-sector	Reusables	Disposables	Subtotal	Reusables	Disposables	Subtotal	Reusables	Disposables	Subtotal	Reusables	Disposables	Totals	Reusables	Disposables	Totals
Printer>	1	Printing	0	0	0	396	158	379	3,723	1,485	3,566	442	176	423	442	176	423
Non-printer>	2	Chemical & Allied Products	158	246	166	554	859	582	2,241	3,473	2,327	478	695	498	759	1,103	790
Non-printer>	3	Plastics & Rubber	161	249	169	563	873	592	2,278	3,530	2,366	437	648	456	692	1,024	722
Non-printer>	4	Fabricated Metal Products	155	240	163	542	841	570	2,194	3,399	2,279	389	587	407	613	923	641
Non-printer>	5	Industrial Machinery & Eqpt	199	309	209	697	1,081	732	2,819	4,388	2,929	471	722	494	738	1,128	774
Non-printer>	6	Electronics & Computers	378	586	397	1,324	2,051	1,391	5,361	8,323	5,569	1,337	1,893	1,387	2,109	3,002	2,188
Non-printer>	7	Transportation Eqpt	147	228	154	514	798	540	2,081	3,229	2,161	463	668	482	735	1,061	764
Non-printer>	8	Furniture & Fixtures	157	244	165	550	852	578	2,226	3,458	2,313	374	571	392	585	894	614
Non-printer>	9	Auto Dealers (retail trade)	149	231	157	521	809	548	2,111	3,273	2,192	388	581	405	613	915	640
Printer>	10	Publishing (printed matter)	0	0	0	354	142	339	3,332	1,336	3,192	402	161	385	402	161	385
Printer>	11	Business services (copy shops)	0	0	0	341	136	326	3,206	1,290	3,072	398	159	381	398	159	381
Non-printer>	12	Auto Repair & Maintenance	144	223	151	503	781	529	2,038	3,123	2,114	324	503	341	505	782	530
Non-printer>	13	Military Bases	182	298	193	633	979	665	2,561	4,009	2,663	768	1,074	795	1,186	1,673	1,228
		Totals =	156	242	164	460	543	467	2,838	3,140	2,859	401	471	407	518	597	525
		Printer average (items 1,10,11)=	0	0	0	377	151	361	3,525	1,410	3,376	425	170	407	425	170	407
		Non-printer average =	156	242	164	547	848	574	2,528	3,921	2,626	389	589	408	615	926	643

Pie-Chart Summary from Section I of Previous Spreadsheet (Disposables + Reusables)

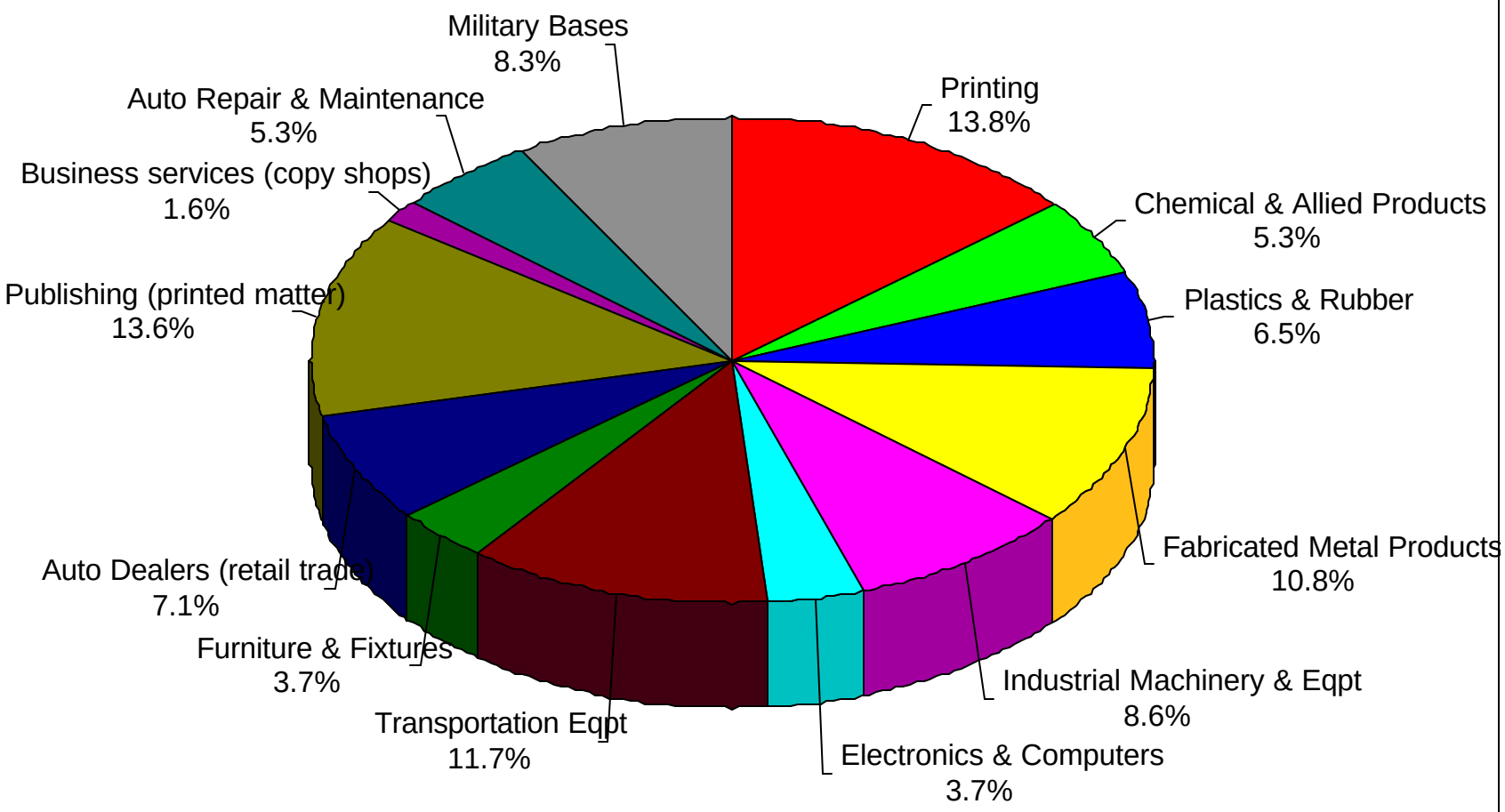



Proportions of Solvent Industrial Wipes Used Across 13 Industries
Based on "Most-Likely" Estimated Year 2001 Quantity of 2.8 Billion Solvent Industrial Wipes Used in the USA
Military Bases
0.2%
Auto Repair & Maintenance
22.9%
Printing
24.2%
Business services (copy shops)
3.4%
Chemical & Allied Products
2.8%
Publishing (printed matter)
12.5%
Plastics & Rubber
3.2%
Auto Dealers (retail trade)
8.2%
Fabricated Metal Products
10.1%
Transportation Eqpt
2.7%
Industrial Machinery & Eqpt
5.9%
Electronics & Computers
3.8%

YEAR 2001 UPDATE COUNT INDUSTRIAL WIPES (with & w/o solvents)						
	Item	Sub-sector	Total Wipe Uses (CESQGs + SQGs + LQGs)			
			Reusables	Disposables	Totals	%
Printer>	1	Printing	853,300,000	25,700,000	879,000,000	9.2%
Non-printer>	2	Chemical & Allied Products	297,000,000	43,300,000	340,300,000	3.5%
Non-printer>	3	Plastics & Rubber	354,800,000	53,100,000	407,900,000	4.2%
Non-printer>	4	Fabricated Metal Products	1,126,500,000	172,400,000	1,298,900,000	13.5%
Non-printer>	5	Industrial Machinery & Eqpt	665,300,000	103,600,000	768,900,000	8.0%
Non-printer>	6	Electronics & Computers	400,600,000	56,200,000	456,800,000	4.8%
Non-printer>	7	Transportation Eqpt	292,000,000	42,100,000	334,100,000	3.5%
Non-printer>	8	Furniture & Fixtures	357,400,000	55,600,000	413,000,000	4.3%
Non-printer>	9	Auto Dealers (retail trade)	912,600,000	138,300,000	1,050,900,000	10.9%
Printer>	10	Publishing (printed matter)	440,800,000	13,300,000	454,100,000	4.7%
Printer>	11	Business services (copy shops)	118,400,000	3,600,000	122,000,000	1.3%
Non-printer>	12	Auto Repair & Maintenance	2,637,700,000	416,800,000	3,054,500,000	31.8%
Non-printer>	13	Military Bases	19,700,000	2,700,000	22,400,000	0.2%
		Totals =	8,476,100,000	1,126,700,000	9,602,800,000	100.0%
		National marketshare =	88.3%	11.7%	100.0%	
		Printer subtotal (items 1+10+11) =	1,412,500,000	42,600,000	1,455,100,000	15.2%
		Non-printer subtotal =	7,063,600,000	1,084,100,000	8,147,700,000	84.8%

Estimated Number of Workers in Industries Using Solvent Industrial Wipes (2001)							
	Item	Sub-sector	1997 Census employees in sub-sector	2001 facility count update multiplier	Year 2001 estimated employees	% facilities "most likely" using solvent wipes	Employees in solvent wipes using facilities
Printer>	1	Printing	838,240	0.969	811,936	100.0%	811,936
Non-printer>	2	Chemical & Allied Products	884,321	1.011	893,996	35.0%	312,899
Non-printer>	3	Plastics & Rubber	1,029,976	1.060	1,092,168	35.0%	382,259
Non-printer>	4	Fabricated Metal Products	1,774,874	1.021	1,811,540	35.0%	634,039
Non-printer>	5	Industrial Machinery & Eqpt	1,421,820	1.014	1,442,294	35.0%	504,803
Non-printer>	6	Electronics & Computers	588,938	1.051	618,832	35.0%	216,591
Non-printer>	7	Transportation Eqpt	1,848,558	1.068	1,974,518	35.0%	691,081
Non-printer>	8	Furniture & Fixtures	604,845	1.016	614,278	35.0%	214,997
Non-printer>	9	Auto Dealers (retail trade)	1,138,995	1.053	1,199,421	35.0%	419,797
Printer>	10	Publishing (printed matter)	739,834	1.082	800,488	100.0%	800,488
Printer>	11	Business services (copy shops)	87,221	1.108	96,630	100.0%	96,630
Non-printer>	12	Auto Repair & Maintenance	815,149	1.091	889,061	35.0%	311,171
Non-printer>	13	Military Bases	1,438,562	0.972	1,398,890	35.0%	489,612
		Totals =	13,211,333	1.043	13,600,000		5,900,000
		Percent =			100.0%		43.4%
		Printer subtotal (items 1+10+11) =	1,665,295		1,709,055		1,709,055
		Non-printer subtotal =	11,546,038		11,890,945		4,190,945

Proportion of Employees Working in 13 Solvent Industrial Wipes Sub-Sectors
(Based on estimated 5.9 million employees in facilities using solvent industrial wipes)



INDUSTRIAL WIPES PROPOSED EXCLUSIONS
COUNT OF AFFECTED SMALL FIRM ESTABLISHMENTS IN STATES WHICH MAY ADOPT THE EXCLUSIONS
(Disposable + Reusable Wipes Generators & Laundries)

Item	Sub-sector	NAICS subsector code	NAICS code used to represent subsector*	Small Firm Size Bins (1997 Economic Census)							Subtotal small firm facilities	Non-small facilities	Total facilities all sizes
				Bin#1	Bin#2	Bin#3	Bin#4	Bin#5	Bin#6	Bin#7			
1	Printing	323*	323110	15,496	9,902	7,058	5,224	2,089	1,317	353	41,440	129	41,569
2	Chemical & Allied Products	325*	325998	675	389	540	535	235	126	33	2,534	9	2,542
3	Plastics & Rubber	326*	326199	585	371	522	749	454	413	125	3,219	32	3,251
4	Fabricated Metal Products	332*	332322	2,395	1,918	2,633	2,748	1,073	539	84	11,390	13	11,403
5	Industrial Machinery & Eqpt	333*	333514	1,907	1,236	1,118	879	233	107	12	5,491	5	5,496
6	Electronics & Computers	3344*	334419	392	196	194	202	125	109	42	1,260	15	1,274
7	Transportation Eqpt	336*	336399	597	311	337	448	277	291	214	2,475	131	2,606
8	Furniture & Fixtures	337*	337122	1,944	619	446	311	160	125	77	3,682	46	3,728
9	Auto Dealers (retail trade)	4411	4411	1,063	1,146	1,323	1,388	741	644	862	7,166	2,170	9,335
10	Publishing (printed matter)	5111	5111	8,495	3,553	2,921	2,626	1,330	1,355	1,132	21,411	2,182	23,594
11	Business services (copy shops)	561439	561439	520	1,128	1,094	806	579	304	0	4,431	1,972	6,404
12	Auto Repair & Maintenance	8111	8111	3,868	9,768	8,239	4,663	2,265	632	0	29,435	1,947	31,382
13	Military Bases	92812	92812	NR	NR	NR	NR	NR	NR	NR	NR	NR	115
			Column subtotals (1+...+13) =	37,938	30,537	26,425	20,578	9,561	5,961	2,934	133,934	8,651	142,700
											93.9%	6.1%	100.0%
14	Linen Supply & Laundering	812332	812332	54	102	89	68	95	81	61	551	624	1,175
											46.9%	53.1%	100.0%
										Grand totals (1+...+14) =	134,485	9,275	143,875
											93.6%	6.4%	100%

Explanatory Notes:

(a) * Indicates that in absence of 1997 Economic Census firm size data for the 3-digit NAICS code manufacturing sub-sectors, the respective largest number of establishments 6-digit NAICS code industry used to represent the size-bin percentage distribution of establishments in each sub-sector.

(b) The 6-digit industry code shown represents the single largest industry by number of establishments within the sub-sector, ranging from 7.2% to 51.0% subsector coverages.

(c) Items 9-14 firm size bin distributions based on exact data (1997 Economic Census) matching the NAICS code displayed.

Disposable Industrial Wipes: US Price Data

Price Data Source #1:

Item	Type of disposable wipe	Case count (nr. wipes)	Price for case	Implied price per wipe
1	Pulp & textile fibers	400	$61.70	$0.15
2	Pulp & textile fibers	200	$25.85	$0.13
3	Pulp & textile fibers	200	$25.70	$0.13
4	Rags (recycled fabrics)	800	$79.95	$0.10
5	Rags (recycled fabrics)	150	$25.50	$0.17
6	Rags (recycled fabrics)	1160	$116.15	$0.10
7	Rags (recycled fabrics)	870	$87.90	$0.10
8	Pulp fibers	180	$12.25	$0.07
9	Pulp fibers	1000	$67.25	$0.07
10	Wood fiber & scrim	900	$65.55	$0.07
11	Wood fiber & scrim	1100	$94.40	$0.09
12		900	$87.65	$0.10
13		900	$70.80	$0.08
14		400	$51.25	$0.13
15		700	$44.00	$0.06
16		1008	$76.60	$0.08
17		672	$65.15	$0.10
18		768	$55.05	$0.07
19		1020	$43.25	$0.04
20		800	$57.30	$0.07
21		800	$64.80	$0.08
22		600	$56.80	$0.09
23		900	$75.85	$0.08
			Minimum	$0.04
			Maximum	$0.17
			Average	$0.09
			Median	$0.09
			Std. Dev.	$0.03

Price Data Source #2:

Item	Carton weight (lbs)	Type of disposable wipe	Carton count (nr. wipes)	Price for case	Implied price per wipe
1	25	Fleece (recycled fabric rags)	400	$24.50	$0.06
2	25	Polo knit (recycled fabric rags)	400	$19.96	$0.05
3	25	Terry towel (recycled fabric rags)	400	$57.50	$0.14
4	10	Reclaimed polo knit rags	160	$10.75	$0.07
				Minimum	$0.05
				Maximum	$0.14
				Average	$0.08
				Median	$0.06
				Std. Dev.	$0.04
			Average of all disposables price data>		**$0.09**

Price Sources (year 2001):

#1: W.W. Grainger Inc. "Industrial Supplies Catalog" (http://www.www.grainger.com)

#2: Fastenal Company "Industrial & Construction Supplies" (http://www.fastenal.com).

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BASELINE EFFECTIVE ANNUAL COST OF USING INDUSTRIAL WIPES
AS A PERCENTAGE OF WIPES GENERATOR ANNUAL OPERATING COSTS

Item	Sub-sector	NAICS code	Natl Avg. Baseline Unit Cost* ($/wipe)	National Annual Effective Cost for Industrial Wipers	Annual Average Wipes Cost Per Facility	Operating Costs as % of Business Revenues	Weighted-avg Operating Revenues Per Facility	Baseline Wipes Annual Cost as % of Operating Costs
A. DISPOSABLE WIPES:								
1	Printing	323	$0.2336	$6,011,894	$2,061	77.3%	$2,082,921	0.10%
2	Chemical & Allied Products	325	$0.2336	$2,943,200	$12,884	59.6%	$6,648,640	0.19%
3	Plastics & Rubber	326	$0.2336	$3,534,606	$11,964	89.7%	$6,878,990	0.17%
4	Fabricated Metal Products	332	$0.2336	$11,260,922	$10,783	78.1%	$2,760,591	0.39%
5	Industrial Machinery & Eqpt	333	$0.2336	$6,670,906	$13,180	80.7%	$1,400,455	0.94%
6	Electronics & Computers	3344	$0.2336	$3,944,864	$35,070	75.1%	$4,246,377	0.83%
7	Transportation Eqpt	336	$0.2336	$2,887,478	$12,388	77.9%	$17,610,264	0.07%
8	Furniture & Fixtures	337	$0.2336	$3,581,632	$10,436	75.3%	$2,201,434	0.47%
9	Auto Dealers (retail trade)	4411	$0.2336	$9,105,096	$10,687	11.7%	$668,734	1.60%
10	Publishing (printed matter)	5111	$0.2336	$3,105,979	$1,876	51.0%	$2,998,041	0.06%
11	Business services (copy shops)	561439	$0.2336	$832,590	$1,853	72.0%	$947,461	0.20%
12	Auto Repair & Maintenance	8111	$0.2336	$26,521,549	$9,136	56.3%	$238,037	3.84%
13	Military Bases	92812	$0.2336	$193,583	$19,544	NR	NR	NR
			Subtotal (or weighted average) =	$80,594,299	$6,977	63.3%	$2,224,169	0.31%
B. REUSABLE WIPES:								
1	Printing	323	$0.0535	$45,652,141	$1,181	77.3%	$2,082,921	0.06%
2	Chemical & Allied Products	325	$0.0535	$4,701,064	$2,032	59.6%	$6,648,640	0.03%
3	Plastics & Rubber	326	$0.0535	$5,468,066	$1,850	89.7%	$6,878,990	0.03%
4	Fabricated Metal Products	332	$0.0535	$16,986,653	$1,640	78.1%	$2,760,591	0.06%
5	Industrial Machinery & Eqpt	333	$0.0535	$9,852,232	$1,975	80.7%	$1,400,455	0.14%
6	Electronics & Computers	3344	$0.0535	$6,556,480	$5,642	75.1%	$4,246,377	0.13%
7	Transportation Eqpt	336	$0.0535	$4,666,821	$1,966	77.9%	$17,610,264	0.01%
8	Furniture & Fixtures	337	$0.0535	$5,300,469	$1,566	75.3%	$2,201,434	0.07%
9	Auto Dealers (retail trade)	4411	$0.0535	$13,901,428	$1,639	11.7%	$668,734	0.25%
10	Publishing (printed matter)	5111	$0.0535	$23,584,544	$1,075	51.0%	$2,998,041	0.04%
11	Business services (copy shops)	561439	$0.0535	$6,334,969	$1,064	72.0%	$947,461	0.11%
12	Auto Repair & Maintenance	8111	$0.0535	$38,440,248	$1,350	56.3%	$238,037	0.57%
13	Military Bases	92812	$0.0535	$332,460	$3,167	NR	NR	NR
			Subtotal (or weighted average) =	$181,777,576	$1,386	63.3%	$2,246,399	0.06%
SUMMARY STATISTICS (Disposables & Reusables):							Min =	0.01%
							Max =	3.84%
							Average =	0.08%

Explanatory Notes:

(a) * Unit Cost Sources:

Disposable wipes: Current price for wipes plus cost for hazardous waste incineration of spent wipes.

Reusable wipes: US Bureau of Census data for industrial laundries (annual $ revenues / annual wipes).

(b) Derivation of each unit cost using these data sources is displayed on another table elsewhere in this study.

Attachment Set B

Industrial Laundry Data

US Census Bureau Industry Quick Report:
Industrial Launderers (NAICS code = 812332)
Selected Industry Statistics by State: 1997 and 1992

Geography	Number of Establishments		Number of Employees		Annual Payroll ($1,000)		Shipments/Sales/Receipts ($1,000)		Population Estimate	
	1992	1997	1992	1997	1992	1997	1992	1997	1992	1997
TAXABLE INDUSTRIES										
United States	1,613	1,435	81,908	63,172	1,670,672	1,199,428	5,007,637	3,649,671	267,743,595	255,077,536
Alabama	37	23	1,956	1,352	36,152	24,209	106,212	69,381	4,322,113	4,137,511
Alaska	1	1	a	e	D	D	D	D	609,655	587,766
Arizona	25	21	1,073	676	21,360	12,414	73,880	37,802	4,553,249	3,832,368
Arkansas	26	26	1,291	967	19,846	15,083	57,057	44,927	2,523,186	2,394,253
California	194	165	9,394	7,379	208,356	157,295	630,257	468,151	32,182,118	30,895,356
Colorado	19	20	828	479	16,904	8,982	47,160	28,481	3,892,029	3,464,675
Connecticut	15	14	766	618	17,377	13,890	49,841	34,979	3,267,240	3,279,116
Delaware	3	3	198	c	6,012	D	15,143	D	735,143	690,884
District of Columbia	1	2	a	a	D	D	D	D	529,895	585,221
Florida	67	54	3,826	2,927	72,405	56,260	214,132	171,343	14,677,181	13,482,716
Georgia	55	40	2,135	2,011	44,405	37,637	131,340	110,419	7,489,982	6,773,364
Hawaii	4	2	30	b	206	D	977	D	1,192,057	1,155,726
Idaho	6	5	163	143	2,575	2,498	7,798	6,446	1,208,865	1,065,885
Illinois	70	66	4,455	2,754	92,480	54,113	289,114	176,080	11,989,352	11,612,906
Indiana	50	41	2,978	1,969	55,997	38,252	169,672	118,232	5,864,847	5,658,323
Iowa	22	25	1,349	1,068	25,885	19,602	70,639	56,275	2,854,330	2,802,944
Kansas	15	20	1,066	609	18,859	11,518	54,480	33,232	2,601,437	2,515,320
Kentucky	34	27	1,946	1,507	33,139	26,979	99,840	74,467	3,910,366	3,753,836
Louisiana	24	22	1,101	1,028	23,681	15,943	73,649	54,049	4,353,646	4,278,889
Maine	7	6	270	194	4,884	3,745	16,334	12,458	1,241,895	1,236,348

Geography	Number of Establishments		Number of Employees		Annual Payroll ($1,000)		Shipments/Sales/Receipts ($1,000)		Population Estimate	
	1992	1997	1992	1997	1992	1997	1992	1997	1992	1997
Maryland	24	23	1,403	1,212	31,821	24,276	106,151	80,221	5,094,924	4,917,269
Massachusetts	34	30	1,406	1,057	33,694	23,565	99,784	75,794	6,114,440	5,992,712
Michigan	80	63	3,591	2,658	73,181	47,933	217,241	137,473	9,779,984	9,433,665
Minnesota	19	22	1,156	971	32,274	20,984	80,823	59,810	4,687,408	4,468,165
Mississippi	10	13	444	586	7,804	8,678	23,328	26,004	2,731,644	2,615,208
Missouri	35	32	1,471	1,188	33,688	22,171	94,545	65,156	5,408,455	5,190,719
Montana	7	11	196	202	3,381	3,005	10,009	8,727	878,730	822,347
Nebraska	12	8	298	253	5,813	3,833	16,051	10,151	1,657,009	1,600,524
Nevada	11	8	e	c	D	D	D	D	1,678,691	1,336,419
New Hampshire	11	9	669	380	18,025	8,438	53,361	27,410	1,172,140	1,115,087
New Jersey	35	40	1,800	1,503	39,265	31,034	108,589	91,110	8,058,384	7,820,260
New Mexico	12	11	421	445	8,738	6,067	28,113	21,100	1,723,965	1,581,830
New York	80	75	2,898	2,451	62,539	54,125	187,592	171,585	18,146,200	18,109,491
North Carolina	52	43	3,219	2,120	59,944	35,252	188,155	113,310	7,430,675	6,836,333
North Dakota	5	2	c	b	D	D	D	D	640,965	634,031
Ohio	84	79	4,866	4,366	99,414	79,196	302,228	269,099	11,192,932	11,021,419
Oklahoma	22	18	1,149	857	19,680	13,451	60,587	41,624	3,321,611	3,205,234
Oregon	18	19	1,228	722	25,286	15,916	70,438	40,793	3,243,272	2,971,567
Pennsylvania	60	63	3,121	2,878	68,220	57,655	216,376	197,392	12,011,278	11,995,405
Rhode Island	5	3	76	b	1,832	D	8,277	D	987,263	1,001,344
South Carolina	28	23	1,255	826	22,757	11,325	73,609	36,165	3,788,119	3,602,854
South Dakota	5	5	128	99	2,489	1,580	5,980	4,484	737,755	708,411
Tennessee	43	32	2,602	1,525	49,964	31,032	134,141	78,604	5,371,693	5,025,261
Texas	121	124	6,971	5,580	123,186	91,647	385,896	285,415	19,385,699	17,682,538

Geography	Number of Establishments		Number of Employees		Annual Payroll ($1,000)		Shipments/Sales/Receipts ($1,000)		Population Estimate	
	1992	1997	1992	1997	1992	1997	1992	1997	1992	1997
Utah	11	13	f	449	D	7,357	D	20,607	2,065,001	1,811,215
Vermont	2	1	b	a	D	D	D	D	588,632	571,334
Virginia	40	33	2,059	1,697	41,291	31,364	119,969	89,819	6,737,489	6,394,481
Washington	27	15	1,101	749	26,289	20,786	69,530	50,399	5,614,151	5,142,746
West Virginia	9	6	408	e	8,068	D	31,346	D	1,815,231	1,808,860
Wisconsin	32	25	1,968	1,239	45,890	24,742	139,402	69,581	5,201,226	4,992,664
Wyoming	4	3	b	c	D	D	D	D	480,043	464,736

Explanatory Notes:

(a) Source: Data based on the US Dept of Commerce, Census Bureau, 1997 Economic Census: http://factfinder.census.gov/home/en/datanotes/exp_econ97.html.
Excludes data for auxiliaries. For Manufacturing industries,only states with 100 employees or more are shown.

(b) Key to footnote letters shown in table:
D: Withheld to avoid disclosing data of individual companies; data are included in higher level totals
N: Not available or not comparable
S: Withheld because estimate did not meet publication standards
Z: Less than half the unit shown

a: 0 - 19 employees	b: 20 - 99 employees	c: 100 - 249 employees	e: 250 - 499 employees
f: 500 - 999 employees	g: 1,000 - 2,499 employees	h: 2,500 - 4,999 employees	i: 5,000 - 9,999 employees
j: 10,000 - 24,999 employees	k: 25,000 - 49,999 employees	l: 50,000 - 99,999 employees	m: 100,000 or more employees
p: 10 to 19 percent estimated	q: 20 to 29 percent estimated	r: Revised	s: Sampling error exceeds 40 percent

Industrial Laundries (NAICS 812332)

All Industrial Laundry Item Services (e.g. industrial garments, wipes, mops, mats, gloves)

	Nr. of firms	% of all firms	Nr. of establishments	% of all establishments
A. 1997 Number of Laundry Establishments Per Firm (Per Company)				
Single unit (establishment) firms	642	80.7%	642	39.8%
Multi-unit firms:	154	19.3%	971	60.2%
Firms with one establishment (single unit firms)	84	10.6%	84	5.2%
Firms with two establishments	28	3.5%	56	3.5%
Firms with 3 or 4 establishments	14	1.8%	47	2.9%
Firms with 5 to 9 establishments	12	1.5%	75	4.6%
Firms with 10 or more establishments	16	2.0%	709	44.0%
Totals =	796	100.0%	1,613	100.0%
Subtotal dealing with industrial wipes =			1,175	
B. 1997 Employment Size of Industrial Laundries:				
Firms operated for entire year	721	90.6%	1,538	95.4%
Firms with <5 employees	168	21.1%	168	10.4%
Firms with 5 to 9 employees	105	13.2%	106	6.6%
Firms with 10 to 19 employees	116	14.6%	117	7.3%
Firms with 20 to 49 employees	147	18.5%	152	9.4%
Firms with 50 to 99 employees	$101	12.7%	120	7.4%
Firms with 100 to 249 employees	$53	6.7%	104	6.4%
Firms with 250 to 499 employees	$16	2.0%	80	5.0%
Firms with 500 to 999 employees	$6	0.8%	98	6.1%
Firms with >1,000 employees	9	1.1%	593	36.8%
Firms not operated for entire year	75	9.4%	75	4.6%
Totals =	796	100.0%	1,613	100.0%
Subtotal dealing with industrial wipes =			1,175	

Source: US Dept of Commerce Bureau of Census, "1997 Economic Census" (Aug & Oct 2000 publications):
http://www.census.gov/prod/ec97/97s81-sz.pdf (Table 3a, page 64)
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Laundry Cleaning & Garment Services Sub-Sector (SIC= 721)
Business Operating Annual Expenses

Item	Business Expense Element	1997 (millions)	1997 % of revenues	1992 (millions)	1992 % of revenues	USEPA-OSW Estimated Avg % of revenues	USEPA-OSW Estimated Type of expense
A. Operating Expenses Compared to Revenues:							
A1	Annual receipts or revenues (income)	$22,399	100.0%	$18,805	100.0%		
	Implied average annual growth in revenues (5-years) =					3.6%	
A2	Operating expenses total	$17,186	76.7%	$14,121	75.1%	75.9%	
A3	Gross profit = gross margin = net income (A1 - A2)	$5,213	23.3%	$4,684	24.9%	24.1%	
A4	Tax on gross profit (Federal + State)*	$2,097	9.4%	$1,884	10.0%	9.7%	
A5	After-tax profit (A3 - A4)	$3,116	13.9%	$2,800	14.9%	**14.4%**	
	Implied average annual growth in after-tax profit (5 years) =					**2.2%**	
B. Break-down of Operating Expenses:							
	Operating expenses total (item A2)	$17,186	100.0%	$14,121	100.0%	100.1%	
B1	Annual payroll	$7,020	40.8%	NR	NR	40.8%	Fixed
B2	Employer costs for fringe benefits	$1,206	7.0%	NR	NR	7.0%	Fixed
B3	Cost of contract labor	$297	1.7%	NR	NR	1.7%	Variable
B4	Taxes & license fees	$226	1.3%	$158	1.1%	1.2%	Fixed
B5	Depreciation & amortization charges	$1,082	6.3%	$927	6.6%	6.4%	Fixed
B6	Lease & rental payments	$1,381	8.0%	$1,052	7.4%	7.7%	Fixed
B7	Telephone & other purchased communications	$215	1.3%	$155	1.1%	1.2%	Fixed
B8	Purchased utilities (e.g. fuels, electricity)	$1,173	6.8%	$1,075	7.6%	7.2%	90%variable
B9	Purchased materials	$138	0.8%	$131	0.9%	0.9%	Variable
B10	Advertising services	$334	1.9%	$242	1.7%	1.8%	Fixed
B11	Purchased repair & maintenance services	$445	2.6%	$381	2.7%	2.6%	Variable
B12	Cost of purchased legal services	$53	0.3%	$58	0.4%	0.4%	Fixed
B13	Cost of purchased accounting, auditing, & book-keeping services	$104	0.6%	$84	0.6%	0.6%	Fixed
B14	Cost of data processing & other computer-related services	$33	0.2%	$21	0.1%	0.2%	Fixed
B15	Other operating expenses**	$3,479	20.2%	$2,858	20.2%	20.2%	90%variable
					Fixed >	**70.0%**	
					Variable >	**30.0%**	

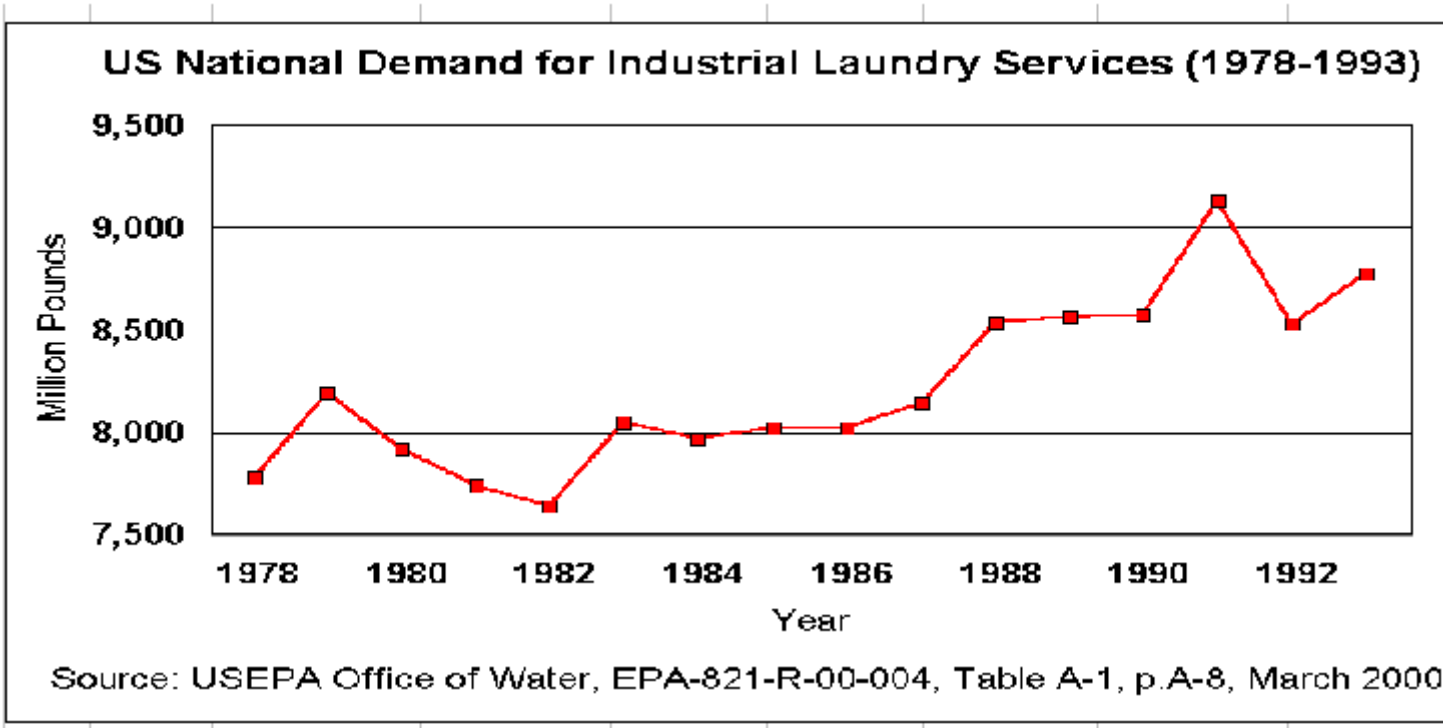
Explanatory Notes:

(a) Source: US Bureau of Census, 1997 Economic Census "Business Expenses", EC97CS-8, Dec 2000, pp.56-96, http://www.census.gov/prod/ec97/e97cs-8.pdf

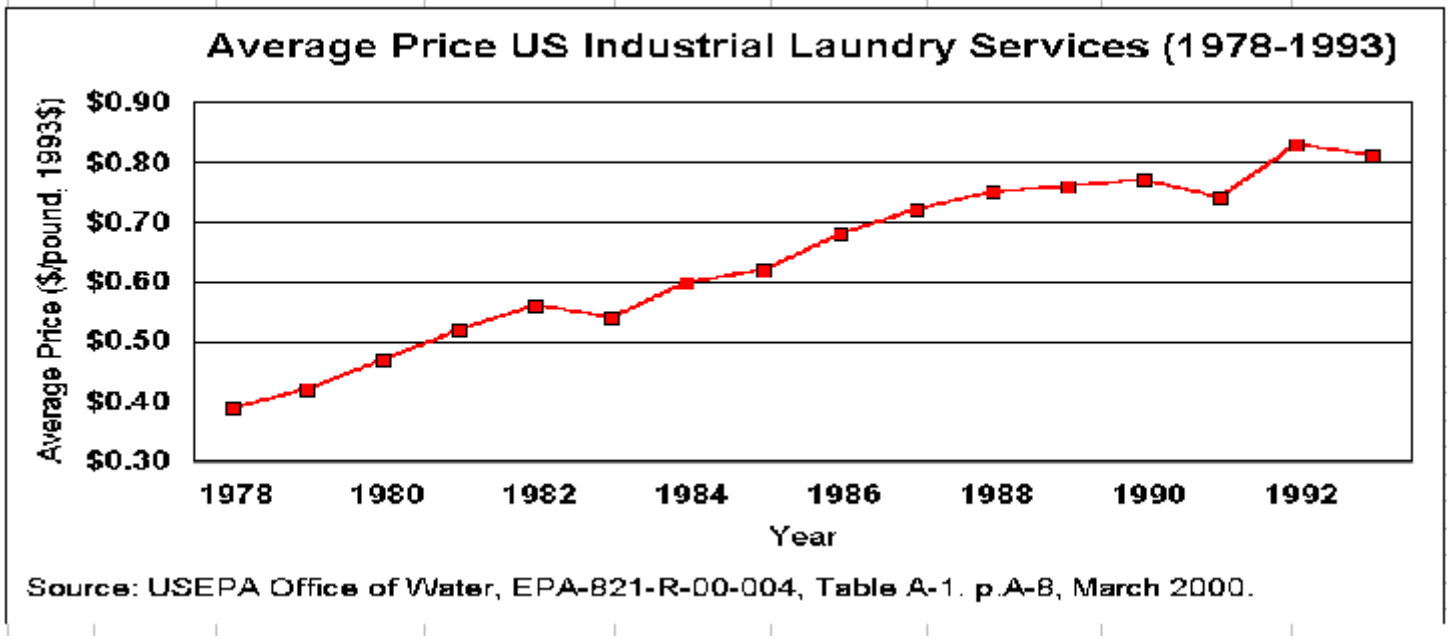
(b) * Tax estimated by multiplying gross profit by marginal income tax rate (EPA-821-R-00-004, pp.B-3 to B-11, March 2000):
Federal income tax rate = 34.00%
Average state income tax rate (avg of corporate & personal) = 6.23%
Combined rate (Federal + State) = 40.23%

(c) NR = Data not reported in source document.

(d) ** Other operating expenses = inventory storage, shipping costs, insurance expense (non-employee), uninsured casualty losses, bad debt losses, & refuse removal (including haz waste).



Source: USEPA Office of Water, EPA-821-R-00-004, Table A-1, p.A-8, March 2000



Source: USEPA Office of Water, EPA-821-R-00-004, Table A-1. p.A-8, March 2000.

HISTORICAL DATA INDUSTRIAL LAUNDRIES (1978-1993)

MODELLING OF NATIONAL DEMAND FOR INDUSTRIAL LAUNDRY SERVICES

		Dependent Variable: Production Quantity** (million lbs)	Independent Variable: Avg Price (P) per pound (1993$)	Exploratory Regression Variables							
				A. Percentage Transformation:				B. Logarithmic Transformation:			
				Dependent	Independent Variables			Dependent	Independent Variables		
Case	Data Year			Variable %Delta Q	Variable1 %Delta P	Variable2 %Delta IPI^	Variable3 %Delta Emp^	Variable Ln(Q)	Variable1 Ln(P)	Variable2 Ln(IPI^)	Variable3 Ln(Emp^)
A. HISTORICAL DATA SERIES:											
1	1978	7,779.91	$0.39					8.960	-0.942	4.309	9.603
2	1979	8,196.14	$0.42	5.4%	7.7%	4.2%	5.7%	9.011	-0.880	4.350	9.656
3	1980	7,917.86	$0.41	-3.4%	11.9%	-12.3%	-3.9%	8.977	-0.766	4.219	9.618
4	1981	7,740.09	$0.52	2.2%	10.6%	5.2%	2.5%	8.955	-0.654	4.270	9.640
5	1982	7,644.05	$0.56	-1.3%	7.7%	-1.7%	-1.9%	8.942	-0.580	4.222	9.593
6	1983	8,048.45	$0.54	5.3%	3.6%	4.0%	0.6%	8.993	-0.616	4.261	9.587
7	1984	7,971.83	$0.60	-1.0%	11.1%	13.9%	9.7%	8.984	-0.511	4.391	9.680
8	1985	8,022.24	$0.62	0.6%	3.3%	6.1%	3.3%	8.990	-0.478	4.451	9.712
9	1986	8,074.72	$0.68	0.0%	9.7%	3.7%	0.9%	8.990	-0.386	4.487	9.721
10	1987	8,143.82	$0.72	1.5%	5.9%	8.4%	2.2%	9.005	-0.329	4.548	9.742
11	1988	8,488.13	$0.75	4.8%	4.2%	4.7%	4.1%	9.052	-0.288	4.594	9.782
12	1989	8,563.08	$0.76	0.3%	1.3%	3.6%	2.7%	9.055	-0.274	4.631	9.809
13	1990	8,582.26	$0.77	0.2%	1.3%	-0.5%	0.6%	9.057	-0.261	4.626	9.815
14	1991	9,136.16	$0.74	6.5%	3.9%	6.0%	3.9%	9.120	-0.301	4.665	9.775
15	1992	8,534.17	$0.83	-6.6%	12.2%	3.6%	0.3%	9.052	-0.186	4.600	9.778
16	1993	8,776.27	$0.81	2.8%	-2.4%	4.6%	2.4%	9.080	-0.211	4.645	9.802
Summary:											
	Min =	7,644.05	$0.39	-6.6%	-3.9%	-12.3%	-4.9%				
	Max =	9,136.16	$0.83	6.5%	12.2%	13.9%	9.7%				
	Range =	19.5%	112.8%	13.1%	16.1%	26.2%	14.6%				
B. REGRESSION RESULTS:											
B1. Simple Regressions (one independent variable):											
Constant		8,827.8		0.0329				9.081			
Std Error of Y Est		289.4		0.0256				0.037			
R Squared		0.55		0.54				0.51			
No. of Observations		16		15				16			
Degrees of Freedom		14		13				14			
X Coefficient(s)		2,198.3		-0.172				0.150			
Std Error of Coef.		529.5		0.122				0.040			
t statistic		4.152		3.081				3.787			
Confidence level (one-tailed)		>99%		>99%				>99%			
B2. Multiple Regressions (three independent variables):											
Constant				0.034				5.024			
Std Error of Y Est				0.025				0.031			
R Squared				0.63				0.70			
No. of Observations				15				16			
Degrees of Freedom				11				12			
X Coefficient(s)				-0.527	-0.246	0.585		-0.017	0.101	0.364	
Std Error of Coef.				0.123	0.230	0.377		0.068	0.251	0.497	
t-statistic				-1.308	-1.068	1.552		-0.256	0.401	0.733	
Confidence level (one-tailed)				>99%		>90%					

Explanatory Notes:

(a) Data source: EPA-821-R-00-001, Table A-1, p.A-8, Mar.2000

(b) ^ IPI = Industrial Production Index (Federal Reserve Board); see companion spreadsheet for IPI data series.
Emp = Number of employees.

(c) ** Production quantity (in pounds) in this table represents all items laundered, not just industrial wipes.

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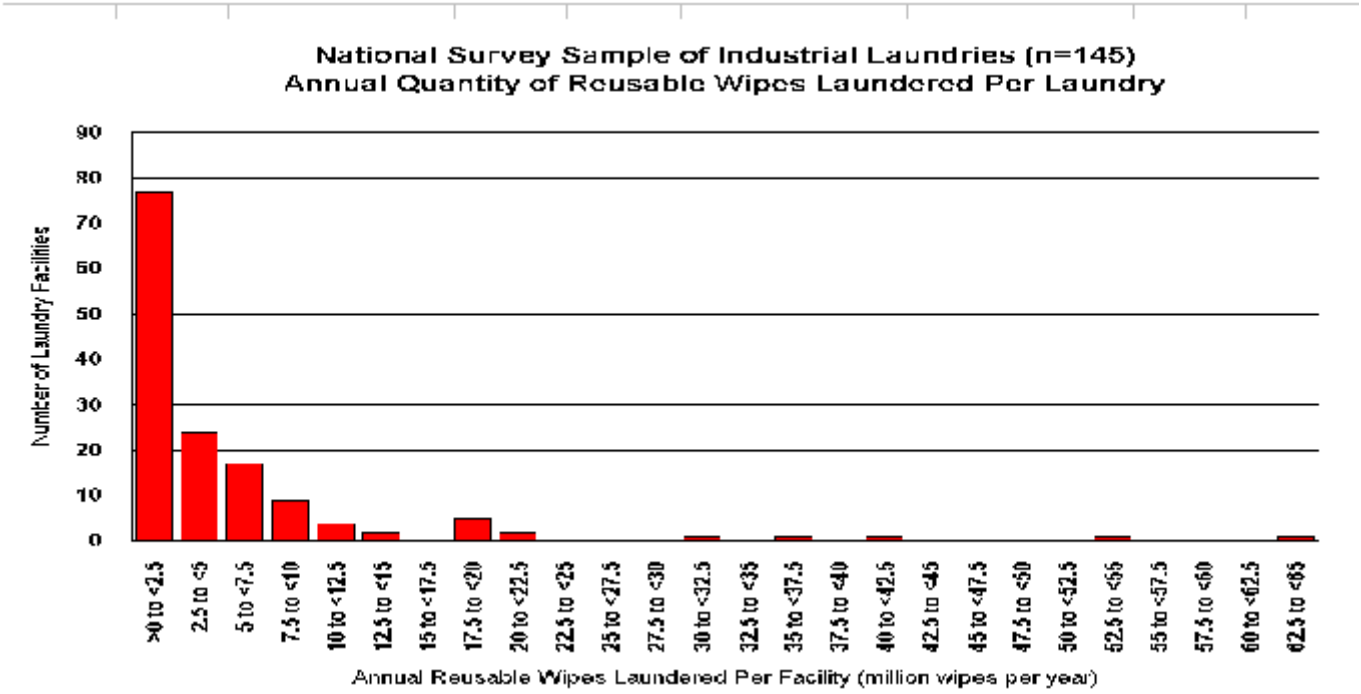
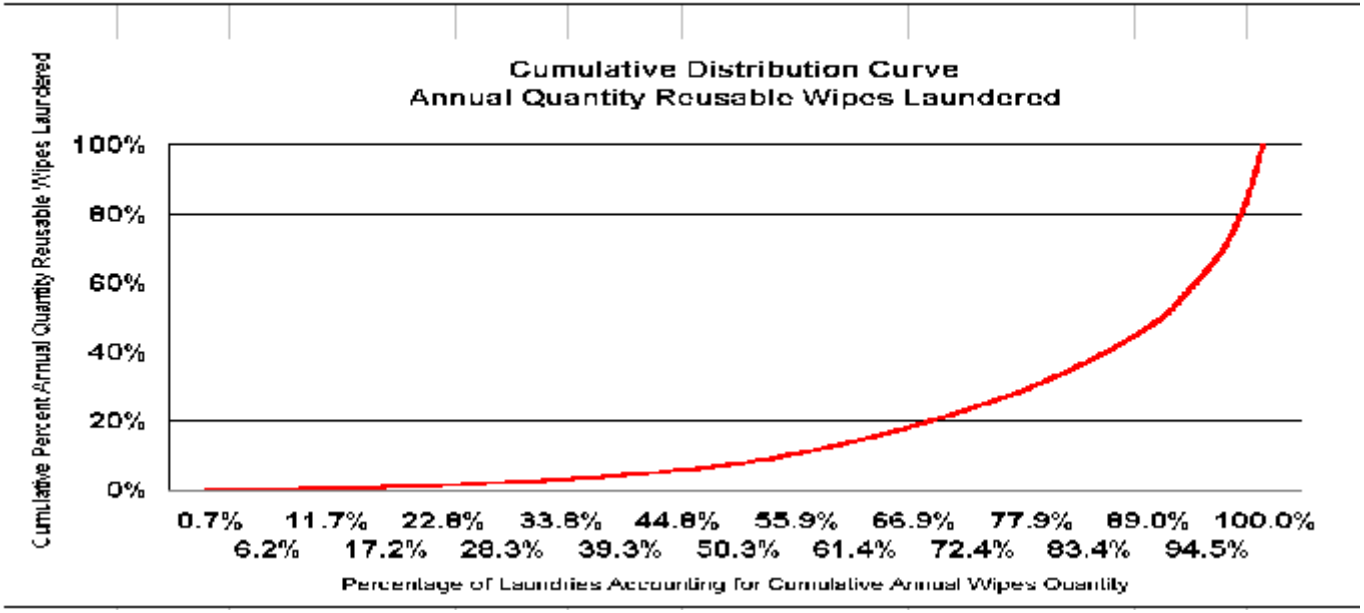
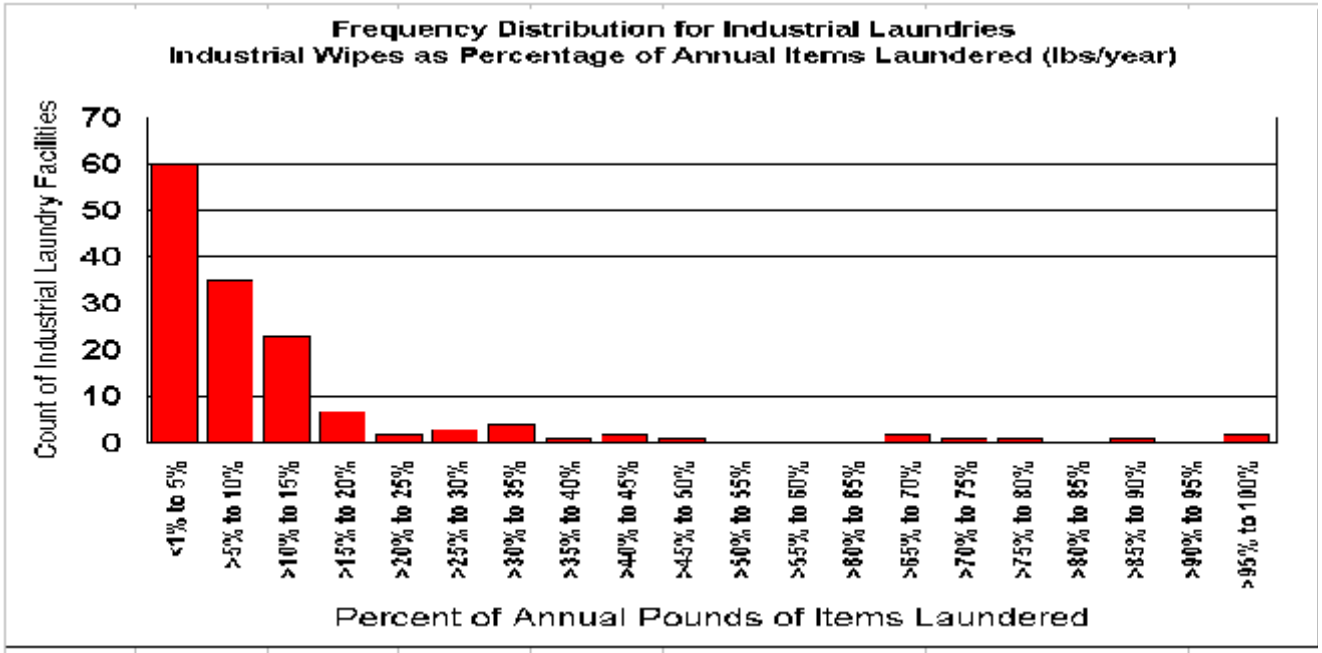
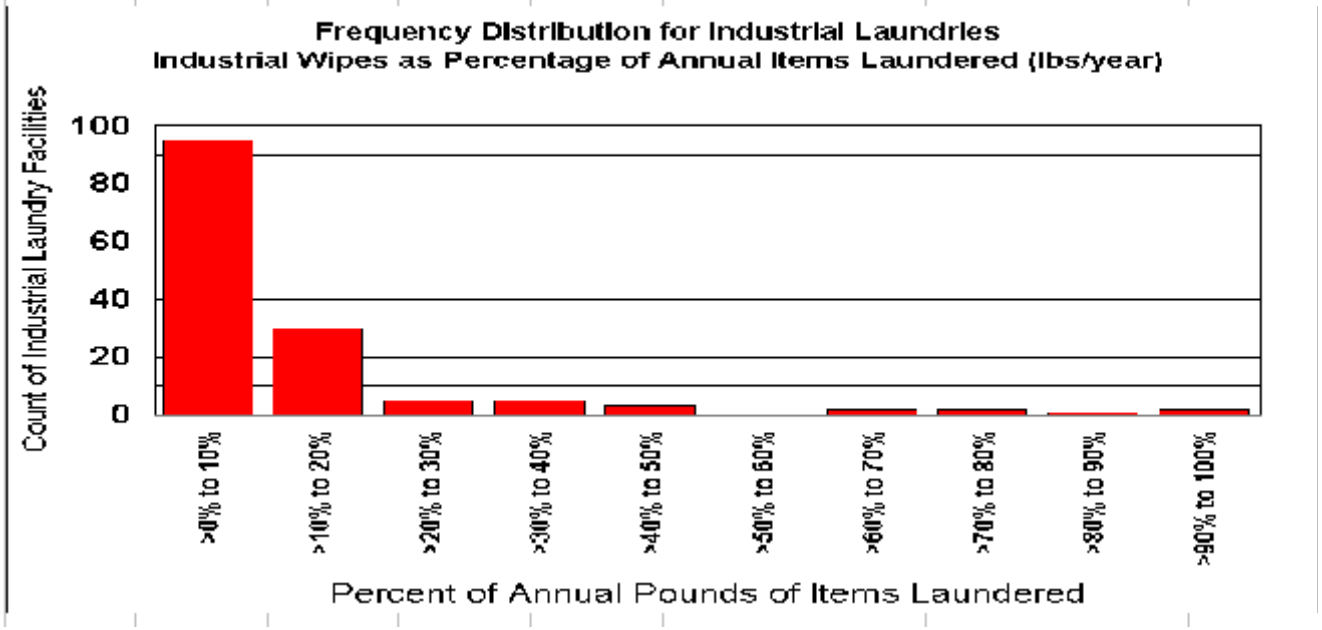


Source: Analysis of USEPA Office of Water 1994 Section 308 National survey sample of industrial laundries.




Frequency Distribution for Industrial Laundries
Industrial Wipes as Percentage of Annual Items Laundered (lbs/year)
Count of Industrial Laundry Facilities
70
60
50
40
30
20
10
0
<1% to 5%
>5% to 10%
>10% to 15%
>15% to 20%
>20% to 25%
>25% to 30%
>30% to 35%
>35% to 40%
>40% to 45%
>45% to 50%
>50% to 55%
>55% to 60%
>60% to 65%
>65% to 70%
>70% to 75%
>75% to 80%
>80% to 85%
>85% to 90%
>90% to 95%
>95% to 100%
Percent of Annual Pounds of Items Laundered


Frequency Distribution for Industrial Laundries
Industrial Wipes as Percentage of Annual Items Laundered (lbs/year)
Count of Industrial Laundry Facilities
100
80
60
40
20
0
>0% to 10%
>10% to 20%
>20% to 30%
>30% to 40%
>40% to 50%
>50% to 60%
>60% to 70%
>70% to 80%
>80% to 90%
>90% to 100%
Percent of Annual Pounds of Items Laundered

Survey Sample of US Industrial Laundries (1994 USEPA) Annual Quantities Distribution of Resuable Wipes Laundered									
A	B	C	D	E	F (D x E)	G (F/ weight)	H	I	J (G x price)
Laundry facility count	Cumltv % of sample	Survey blind ID	Total annual all items laundered (pounds)	% of annual items which are reusable wipes*	Annual reusable wipes laundered (pounds)	Annual reusable wipes laundered** (nr. wipes)	Cumulative reusable wipes laundered** (nr. wipes)	Cumltv % annual wipes	2001 implied annual wipes revenues*** per laundry
1	0.7%	S3636	229,276	2%	4,586	36,684	36,684	0.005%	$1,963
2	1.4%	S5204	483,600	1%	4,836	38,688	75,372	0.01%	$2,070
3	2.1%	S7286	646,764	1%	6,468	51,741	127,113	0.02%	$2,768
4	2.8%	S7211	501,636	2%	10,033	80,262	207,375	0.03%	$4,294
5	3.4%	S3663	1,271,980	1%	12,720	101,758	309,133	0.04%	$5,444
6	4.1%	S2098	1,508,366	1%	15,084	120,669	429,803	0.06%	$6,456
7	4.8%	S3916	948,965	2%	18,979	151,834	581,637	0.07%	$8,123
8	5.5%	S6248	1,180,608	2%	23,612	188,897	770,534	0.10%	$10,106
9	6.2%	S7499	302,956	9%	27,266	218,128	988,663	0.13%	$11,670
10	6.9%	S3908	2,741,834	1%	27,418	219,347	1,208,009	0.15%	$11,735
11	7.6%	S7374	3,000,000	1%	30,000	240,000	1,448,009	0.19%	$12,840
12	8.3%	S7383	3,256,744	1%	32,567	260,540	1,708,549	0.22%	$13,939
13	9.0%	S6924	3,283,118	1%	32,831	262,649	1,971,198	0.25%	$14,052
14	9.7%	S7766	3,409,652	1%	34,097	272,772	2,243,971	0.29%	$14,594
15	10.3%	S5152	3,554,170	1%	35,542	284,334	2,528,304	0.32%	$15,212
16	11.0%	S4370	1,209,400	3%	36,282	290,256	2,818,560	0.36%	$15,529
17	11.7%	S2446	4,353,336	1%	43,533	348,267	3,166,827	0.41%	$18,633
18	12.4%	S8572	1,494,087	3%	44,823	358,581	3,525,408	0.45%	$19,184
19	13.1%	S1045	2,464,339	2%	49,287	394,294	3,919,702	0.50%	$21,095
20	13.8%	S8272	1,253,200	4%	50,128	401,024	4,320,726	0.55%	$21,455
21	14.5%	S3023	840,000	6%	50,400	403,200	4,723,926	0.61%	$21,572
22	15.2%	S7539	1,698,991	3%	50,970	407,758	5,131,684	0.66%	$21,815
23	15.9%	S1032	2,571,239	2%	51,425	411,398	5,543,082	0.71%	$22,010
24	16.6%	S6197	5,167,100	1%	51,671	413,368	5,956,450	0.76%	$22,116
25	17.2%	S2877	5,317,487	1%	53,175	425,399	6,381,849	0.82%	$22,759
26	17.9%	S6502	5,720,000	1%	57,200	457,600	6,839,449	0.88%	$24,482
27	18.6%	S9066	6,440,344	1%	64,403	515,228	7,354,677	0.94%	$27,565
28	19.3%	S6185	6,937,000	1%	69,370	554,960	7,909,637	1.0%	$29,691
29	20.0%	S6220	7,008,543	1%	70,085	560,683	8,470,320	1.1%	$29,997
30	20.7%	S2014	658,948	11%	72,484	579,874	9,050,194	1.2%	$31,024
31	21.4%	S8214	7,603,619	1%	76,036	608,290	9,658,484	1.2%	$32,544
32	22.1%	S1370	7,612,995	1%	76,130	609,040	10,267,524	1.3%	$32,584
33	22.8%	S4297	1,092,000	7%	76,440	611,520	10,879,044	1.4%	$32,717
34	23.4%	S8896	7,967,906	1%	79,679	637,432	11,516,476	1.5%	$34,103
35	24.1%	S6154	3,994,952	2%	79,899	639,192	12,155,668	1.6%	$34,197
36	24.8%	S3166	243,600	35%	85,260	682,080	12,837,748	1.6%	$36,492
37	25.5%	S7826	2,142,733	4%	85,709	685,675	13,523,423	1.7%	$36,684

A	B	C	D	E	F (D x E)	G (F/ weight)	H	I	J (G x price)
Laundry facility count	Cumltv % of sample	Survey blind ID	Total annual all items laundered (pounds)	% of annual items which are reusable wipes*	Annual reusable wipes laundered (pounds)	Annual reusable wipes laundered** (nr. wipes)	Cumulative reusable wipes laundered** (nr. wipes)	Cumltv % annual wipes	2001 implied annual wipes revenues*** per laundry
38	26.2%	S8229	2,240,108	4%	89,604	716,835	14,240,257	1.8%	$38,351
39	26.9%	S2047	9,304,724	1%	93,047	744,378	14,984,635	1.9%	$39,825
40	27.6%	S2439	1,894,848	5%	94,742	757,939	15,742,575	2.0%	$40,550
41	28.3%	S5203	2,389,725	4%	95,589	764,712	16,507,287	2.1%	$40,913
42	29.0%	S5001	1,210,418	8%	96,833	774,668	17,281,954	2.2%	$41,445
43	29.7%	S2173	1,387,427	7%	97,120	776,959	18,058,913	2.3%	$41,568
44	30.3%	S6192	1,394,745	7%	97,632	781,057	18,839,970	2.4%	$41,787
45	31.0%	S6804	2,604,800	4%	104,192	833,536	19,673,506	2.5%	$44,595
46	31.7%	S3481	1,810,600	6%	108,636	869,088	20,542,594	2.6%	$46,497
47	32.4%	S6642	3,689,660	3%	110,690	885,518	21,428,113	2.7%	$47,376
48	33.1%	S3566	948,668	12%	113,840	910,721	22,338,834	2.9%	$48,724
49	33.8%	S7409	11,741,500	1%	117,415	939,320	23,278,154	3.0%	$50,255
50	34.5%	S5612	1,748,898	7%	122,423	979,383	24,257,537	3.1%	$52,398
51	35.2%	S3743	12,480,000	1%	124,800	998,400	25,255,937	3.2%	$53,415
52	35.9%	S7325	3,327,102	4%	133,084	1,064,673	26,320,610	3.4%	$56,961
53	36.6%	S2181	4,483,200	3%	134,496	1,075,968	27,396,578	3.5%	$57,565
54	37.2%	S6128	3,449,812	4%	137,992	1,103,940	28,500,517	3.7%	$59,062
55	37.9%	S6554	14,061,564	1%	140,616	1,124,925	29,625,443	3.8%	$60,185
56	38.6%	S2086	1,872,900	8%	149,832	1,198,656	30,824,099	4.0%	$64,129
57	39.3%	S2310	1,500,000	10%	150,000	1,200,000	32,024,099	4.1%	$64,201
58	40.0%	S8267	4,391,868	4%	175,675	1,405,398	33,429,496	4.3%	$75,190
59	40.7%	S2790	17,757,000	1%	177,570	1,420,560	34,850,056	4.5%	$76,001
60	41.4%	S6934	18,280,102	1%	182,801	1,462,408	36,312,464	4.7%	$78,240
61	42.1%	S9459	3,050,632	6%	183,038	1,464,303	37,776,768	4.8%	$78,342
62	42.8%	S7035	1,576,406	12%	189,169	1,513,350	39,290,118	5.0%	$80,966
63	43.4%	S6089	2,707,229	7%	189,506	1,516,048	40,806,166	5.2%	$81,110
64	44.1%	S9040	1,804,114	11%	198,453	1,587,620	42,393,786	5.4%	$84,939
65	44.8%	S5567	5,005,238	4%	200,210	1,601,676	43,995,462	5.6%	$85,691
66	45.5%	S9164	2,686,898	8%	214,952	1,719,615	45,715,077	5.9%	$92,001
67	46.2%	S7773	4,515,863	5%	225,793	1,806,345	47,521,422	6.1%	$96,641
68	46.9%	S2394	6,078,134	4%	243,125	1,945,003	49,466,425	6.3%	$104,060
69	47.6%	S9337	4,869,126	5%	243,456	1,947,650	51,414,076	6.6%	$104,201
70	48.3%	S4170	647,540	39%	252,541	2,020,325	53,434,400	6.9%	$108,089
71	49.0%	S6167	334,500	76%	254,220	2,033,760	55,468,160	7.1%	$108,808
72	49.7%	S1978	5,188,426	5%	259,421	2,075,370	57,543,531	7.4%	$111,034
73	50.3%	S1913	6,671,397	4%	266,856	2,134,847	59,678,378	7.7%	$114,216
74	51.0%	S2888	4,573,524	6%	274,411	2,195,292	61,873,669	7.9%	$117,450
75	51.7%	S2208	4,885,520	6%	293,131	2,345,050	64,218,719	8.2%	$125,462
76	52.4%	S5129	2,721,868	11%	299,405	2,395,244	66,613,963	8.5%	$128,148
77	53.1%	S7988	2,812,940	11%	309,423	2,475,387	69,089,350	8.9%	$132,436

A	B	C	D	E	F (D x E)	G (F/ weight)	H	I	J (G x price)
Laundry facility count	Cumltv % of sample	Survey blind ID	Total annual all items laundered (pounds)	% of annual items which are reusable wipes*	Annual reusable wipes laundered (pounds)	Annual reusable wipes laundered** (nr. wipes)	Cumulative reusable wipes laundered** (nr. wipes)	Cumltv % annual wipes	2001 implied annual wipes revenues*** per laundry
78	53.8%	S5573	3,601,750	10%	360,175	2,881,400	71,970,750	9.2%	$154,158
79	54.5%	S5246	3,348,000	11%	368,280	2,946,240	74,916,990	9.6%	$157,627
80	55.2%	S6654	6,403,896	6%	384,234	3,073,870	77,990,860	10.0%	$164,455
81	55.9%	S8724	6,466,500	6%	387,990	3,103,920	81,094,780	10.4%	$166,063
82	56.6%	S3339	4,945,165	8%	395,613	3,164,906	84,259,686	10.8%	$169,326
83	57.2%	S8363	6,833,671	6%	410,020	3,280,162	87,539,848	11.2%	$175,492
84	57.9%	S9017	3,812,700	11%	419,397	3,355,176	90,895,024	11.7%	$179,505
85	58.6%	S3477	8,431,384	5%	421,569	3,372,554	94,267,577	12.1%	$180,435
86	59.3%	S1407	10,642,836	4%	425,713	3,405,708	97,673,285	12.5%	$182,209
87	60.0%	S6530	4,949,964	9%	445,497	3,563,974	101,237,259	13.0%	$190,676
88	60.7%	S3941	6,978,400	7%	488,488	3,907,904	105,145,163	13.5%	$209,077
89	61.4%	S4767	6,113,872	8%	489,110	3,912,878	109,058,041	14.0%	$209,343
90	62.1%	S4996	5,539,560	9%	498,560	3,988,483	113,046,524	14.5%	$213,388
91	62.8%	S6983	12,473,000	4%	498,920	3,991,360	117,037,884	15.0%	$213,542
92	63.4%	S9778	7,293,722	7%	510,561	4,084,484	121,122,368	15.5%	$218,524
93	64.1%	S1452	6,395,584	8%	511,647	4,093,174	125,215,542	16.1%	$218,989
94	64.8%	S9832	3,630,698	15%	544,605	4,356,838	129,572,380	16.6%	$233,095
95	65.5%	S9372	9,618,000	6%	577,080	4,616,640	134,189,020	17.2%	$246,995
96	66.2%	S6812	845,000	69%	583,050	4,664,400	138,853,420	17.8%	$249,550
97	66.9%	S9223	4,859,520	12%	583,142	4,665,139	143,518,559	18.4%	$249,590
98	67.6%	S2136	9,765,661	6%	585,940	4,687,517	148,206,076	19.0%	$250,787
99	68.3%	S7387	1,767,350	34%	600,899	4,807,192	153,013,268	19.6%	$257,190
100	69.0%	S5510	693,000	87%	602,910	4,823,280	157,836,548	20.3%	$258,050
101	69.7%	S5003	4,350,840	14%	609,118	4,872,941	162,709,489	20.9%	$260,707
102	70.3%	S2798	4,502,249	14%	630,315	5,042,519	167,752,008	21.5%	$269,780
103	71.0%	S5467	5,852,600	11%	643,786	5,150,288	172,902,296	22.2%	$275,546
104	71.7%	S4436	5,444,820	12%	653,378	5,227,027	178,129,323	22.9%	$279,651
105	72.4%	S1515	672,543	100%	672,543	5,380,344	183,509,667	23.5%	$287,854
106	73.1%	S3334	16,880,551	4%	675,222	5,401,776	188,911,444	24.2%	$289,000
107	73.8%	S8052	3,602,874	19%	684,546	5,476,368	194,387,812	24.9%	$292,991
108	74.5%	S8942	11,463,000	6%	687,780	5,502,240	199,890,052	25.6%	$294,375
109	75.2%	S1200	4,129,424	17%	702,002	5,616,017	205,506,069	26.4%	$300,462
110	75.9%	S3895	11,704,000	6%	702,240	5,617,920	211,123,989	27.1%	$300,564
111	76.6%	S4261	3,364,400	23%	773,812	6,190,496	217,314,485	27.9%	$331,198
112	77.2%	S6893	5,223,696	15%	783,554	6,268,435	223,582,920	28.7%	$335,367
113	77.9%	S2494	13,476,190	6%	808,571	6,468,571	230,051,491	29.5%	$346,075
114	78.6%	S6385	4,414,132	19%	838,685	6,709,481	236,760,972	30.4%	$358,964
115	79.3%	S1351	5,700,786	15%	855,118	6,840,943	243,601,915	31.3%	$365,997
116	80.0%	S9044	22,010,000	4%	880,400	7,043,200	250,645,115	32.2%	$376,818
117	80.7%	S9279	9,902,160	9%	891,194	7,129,555	257,774,670	33.1%	$381,438

A	B	C	D	E	F (D x E)	G (F/ weight)	H	I	J (G x price)
Laundry facility count	Cumltv % of sample	Survey blind ID	Total annual all items laundered (pounds)	% of annual items which are reusable wipes*	Annual reusable wipes laundered (pounds)	Annual reusable wipes laundered** (nr. wipes)	Cumulative reusable wipes laundered** (nr. wipes)	Cumltv % annual wipes	2001 implied annual wipes revenues*** per laundry
118	81.4%	S3354	30,383,488	3%	911,505	7,292,037	265,066,707	34.0%	$390,131
119	82.1%	S8535	3,789,160	26%	985,182	7,881,453	272,948,160	35.0%	$421,666
120	82.8%	S3316	8,985,987	11%	988,459	7,907,669	280,855,829	36.0%	$423,068
121	83.4%	S5555	12,580,735	8%	1,006,459	8,051,670	288,907,499	37.1%	$430,772
122	84.1%	S7782	1,534,595	68%	1,043,525	8,348,197	297,255,696	38.1%	$446,637
123	84.8%	S8371	7,153,000	15%	1,072,950	8,583,600	305,839,296	39.2%	$459,231
124	85.5%	S8987	6,914,960	16%	1,106,394	8,851,149	314,690,445	40.4%	$473,545
125	86.2%	S2381	10,245,664	11%	1,127,023	9,016,184	323,706,629	41.5%	$482,375
126	86.9%	S5433	10,341,760	11%	1,137,594	9,100,749	332,807,378	42.7%	$486,899
127	87.6%	S3803	11,581,224	10%	1,158,122	9,264,979	342,072,357	43.9%	$495,686
128	88.3%	S3233	7,529,300	17%	1,279,981	10,239,848	352,312,205	45.2%	$547,842
129	89.0%	S6747	26,150,797	5%	1,307,540	10,460,319	362,772,524	46.5%	$559,637
130	89.7%	S4242	13,774,506	10%	1,377,451	11,019,605	373,792,128	48.0%	$589,560
131	90.3%	S1744	8,371,375	17%	1,423,134	11,385,070	385,177,198	49.4%	$609,113
132	91.0%	S1243	13,173,000	14%	1,844,220	14,753,760	399,930,958	51.3%	$789,341
133	91.7%	S8392	12,296,230	15%	1,844,435	14,755,476	414,686,434	53.2%	$789,433
134	92.4%	S2627	3,016,350	74%	2,232,099	17,856,792	432,543,226	55.5%	$955,356
135	93.1%	S9892	5,264,740	43%	2,263,838	18,110,706	450,653,932	57.8%	$968,941
136	93.8%	S1937	8,122,459	29%	2,355,513	18,844,105	469,498,037	60.2%	$1,008,178
137	94.5%	S9672	18,313,017	13%	2,380,692	19,045,538	488,543,575	62.7%	$1,018,955
138	95.2%	S8250	8,016,817	31%	2,485,213	19,881,706	508,425,281	65.2%	$1,063,691
139	95.9%	S1029	2,588,045	100%	2,588,045	20,704,360	529,129,641	67.9%	$1,107,704
140	96.6%	S9807	5,875,600	45%	2,644,020	21,152,160	550,281,801	70.6%	$1,131,661
141	97.2%	S3274	22,397,023	17%	3,807,494	30,459,951	580,741,752	74.5%	$1,629,638
142	97.9%	S1341	18,707,661	25%	4,676,915	37,415,322	618,157,074	79.3%	$2,001,757
143	98.6%	S7222	18,875,800	28%	5,285,224	42,281,792	660,438,866	84.7%	$2,262,118
144	99.3%	S3738	14,369,400	47%	6,753,618	54,028,944	714,467,810	91.7%	$2,890,602
145	100.0%	S4660	24,607,500	33%	8,120,475	64,963,800	779,431,610	100.0%	$3,475,628
Summary Statistics:									
		Column total =	897,274,203		97,428,951	779,431,610			$41,700,362
		D&E, E&F correlation coefficients**** =		-0.104	0.417		J&E correlation coefficient**** =		0.417
		Median =	4,515,863	6%	**266,856**	**2,134,847**			$114,216
		Pounds-weighted mean =		**11%**					
		Min =	229,276	1%	4,586	36,684			$1,963
		Max =	30,383,488	100%	8,120,475	64,963,800			$3,475,628
		Simple mean =	6,188,098	13%	671,924	5,375,390			$287,589
		Skewness***** =	1.73	2.98	3.86	3.86			
		Kurtosis***** =	3.24	9.28	17.74	17.74			
Explanatory Notes:									

A	B	C	D	E	F (D x E)	G (F/ weight)	H	I	J (G x price)
Laundry facility count	Cumltv % of sample	Survey blind ID	Total annual all items laundered (pounds)	% of annual items which are reusable wipes*	Annual reusable wipes laundered (pounds)	Annual reusable wipes laundered** (nr. wipes)	Cumulative reusable wipes laundered** (nr. wipes)	Cumltv % annual wipes	2001 implied annual wipes revenues*** per laundry

! Source: USEPA Office of Water, 1994 Section 308 National Survey Sample (EPA-821-R-00-004, March 2000).

! *Reusable wipes = Shop and/or printer towels

! ** Number wipes estimated assuming average weight per soiled (solvent-contaminated) reusable wipe (lbs/wipe) = 0.125

! *** Implied annual wipes revenues per laundry estimated by multiplying wipes quantity by 2001 average price ($/wipe) = $0.0535

! Three alternative indicators of sample size (for purpose of benchmarking sample relative to industrial laundry national universe):

(1) Reusable wipes revenues: Estimate of industrial laundry resuable wipes national revenues in 2001 = $412,900,000
Survey sample subtotal revenues as percentage of 2001 national revenues = 10.1%

(2) Laundry facility universe: National total industrial laundries handling reusable industrial wipes = 1,175
Survey sample subtotal facility count as percentage of national total = 12.3%

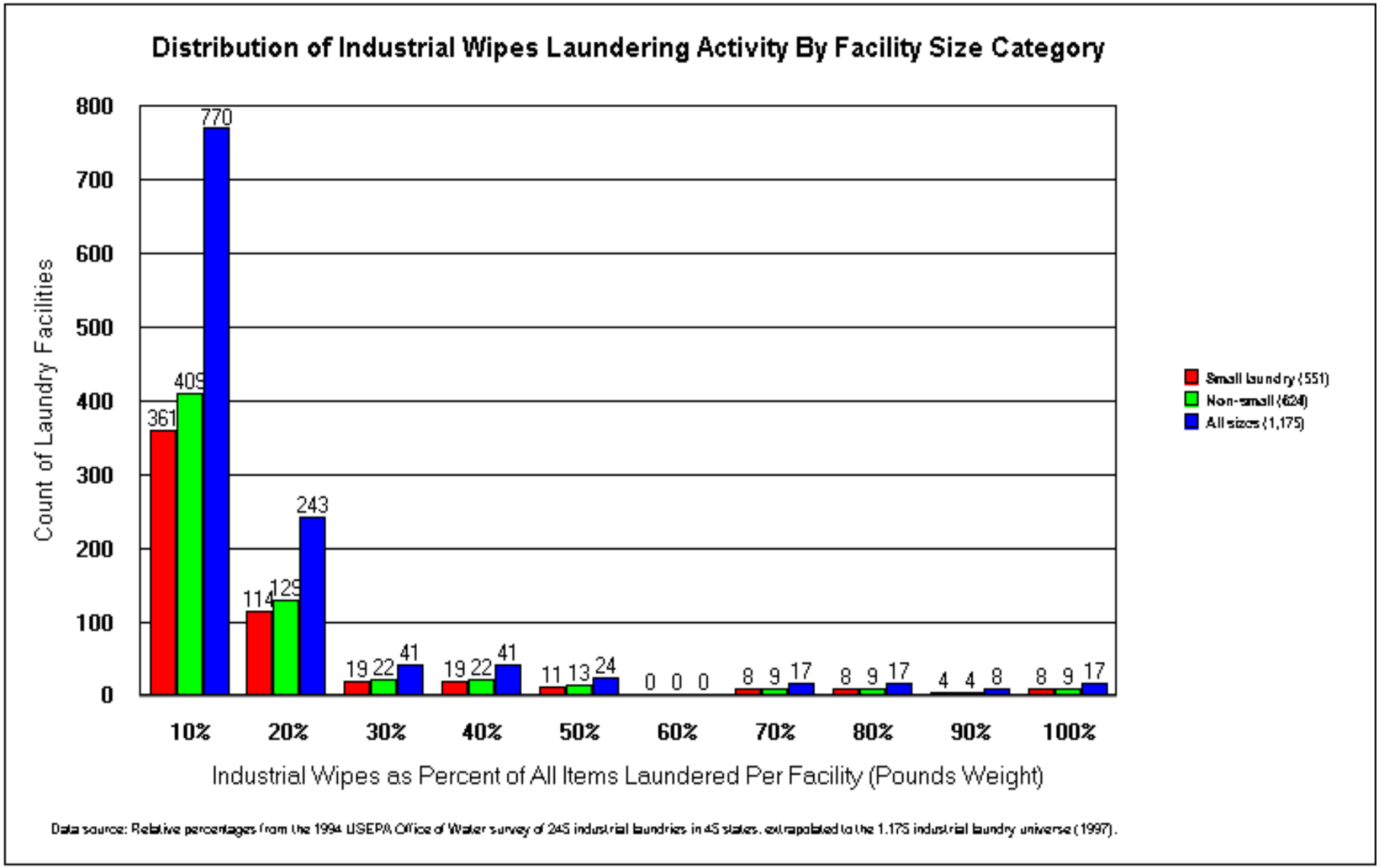
(3) Reusable wipes universe: 2001 national annual total reusable industrial wipes uses = 8,476,100,000
Survey sample subtotal facility count as percentage of national total = 9.2%

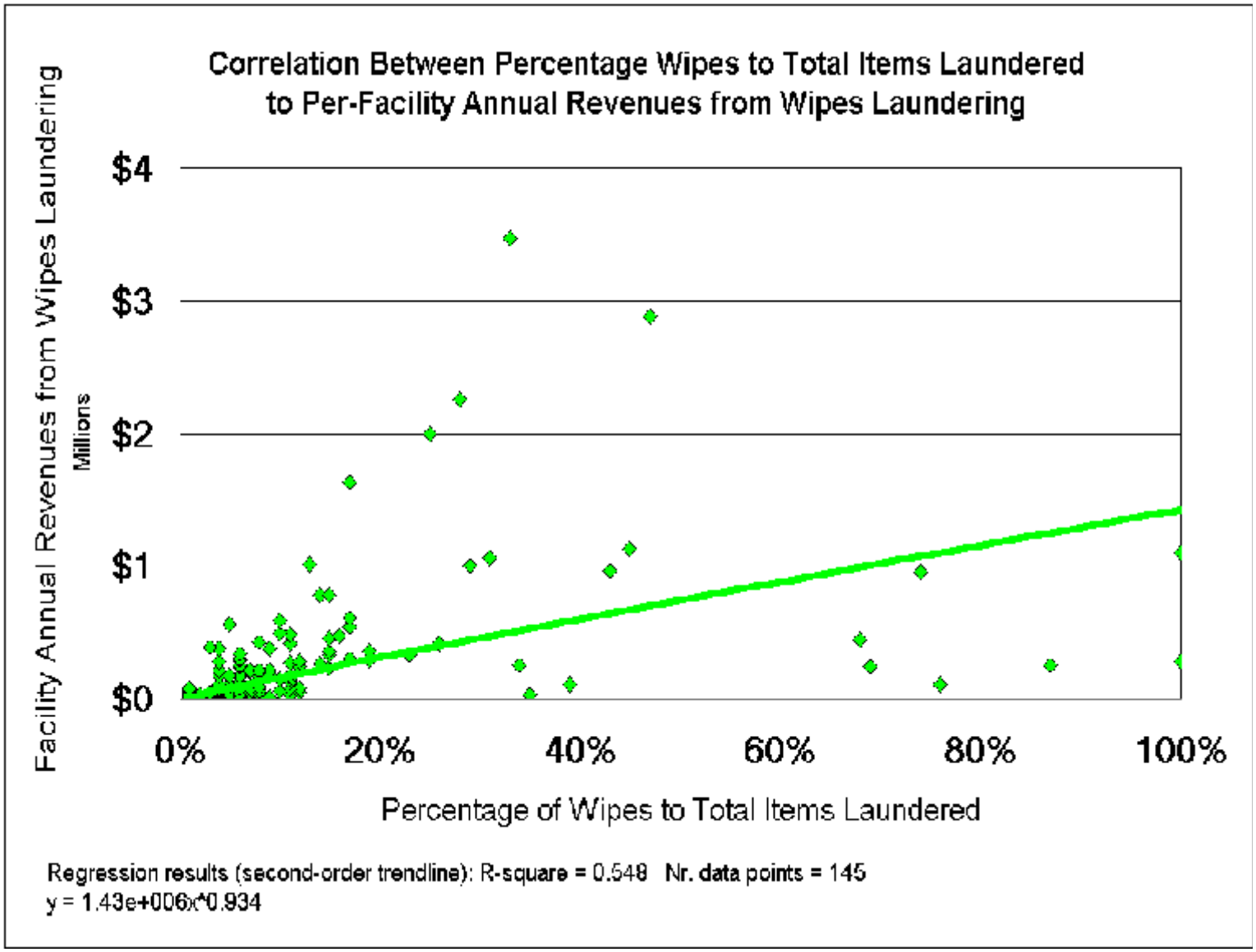
(4) Wipes containers equivalents: Number of container equivalents for above reusable wipes universe = 15,302,833
Survey sample subtotal container equivalents as percentage of universe = 9.2%

! **** Correlation coefficient: measures the strength of linear relationship between two variables (-1 = negative; +1 = positive; 0= none).

! ***** Skewness and kurtosis indicate data distribution shape relative to normal curve.

Skewness >0 indicates distribution shape elongated to right (mean > median).
Kurtosis >0 indicates distribution shape is a peaked or pointed distribution.


Distribution of Industrial Wipes Laundering Activity By Facility Size Category
Count of Laundry Facilities
800
700
600
500
400
300
200
100
0
361
409
770
114
129
243
19 22 41
19 22 41
11 13 24
0 0 0
8 9 17
8 9 17
4 4 8
8 9 17
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
Industrial Wipes as Percent of All Items Laundered Per Facility (Pounds Weight)
Small laundry (551)
Non-small (624)
All sizes (1,175)
Data source: Relative percentages from the 1994 USEPA Office of Water survey of 245 industrial laundries in 45 states, extrapolated to the 1,175 industrial laundry universe (1997).


Correlation Between Percentage Wipes to Total Items Laundered
to Per-Facility Annual Revenues from Wipes Laundering
Facility Annual Revenues from Wipes Laundering
Millions
$4
$3
$2
$1
$0
0%
20%
40%
60%
80%
100%
Percentage of Wipes to Total Items Laundered
Regression results (second-order trendline): R-square = 0.548 Nr. data points = 145
y = 1.43e+006x^0.934

Attachment Set C

Industrial Cleaning/Degreasing Solvent Data

CHEMICAL IDENTITY, US HAZARD STATUS, US PRICE DATA, AND US CONSUMPTION OF INDUSTRIAL CLEANING/DEGREASING SOLVENTS

A. Chemical Identity:				B. US Hazard Status:				C. US Average Price:								D. US Consumption:		
Item	Solvent Chemical Name	Synonyms	Cas Number	RCRA hazardous wastecode* (40 CFR 261)	Toxic Air Pollutant UAT	HAP1	HAP2	Price data source	Reference price basis	1994-99 price range Low	High	Current US avg price**	Current avg price standardized ($/gal)***	X if Fxxx	X if not Fxxx	1997 all solvent uses**** (mill lbs)	1997 solvents for cleaning & degrease (mill.lbs)	X if wipes landfill disposal ineligible
1	Acetone	2-Propanone, Methyl ketone	67-64-1	F003, U002				A	$/pound	$0.39	$0.42	$0.42	$3.28	X		420	187	
								B	$/pound			$0.24	$1.87	X				
2	Benzene		71-43-2	D018, F005, U019	X	X	X	A	$/gallon	$0.82	$1.55	$0.75	$0.75	X		Small	0	X
3	n-butanol	n-Butyl alcohol	71-36-3	F003, U031				A	$/pound	$0.36	$0.50	$0.50	$3.90	X		18	18	
4	n-butyl acetate	Acetic acid n-butyl ester	123-86-4					A	$/pound	$0.39	$0.61	$0.54	$4.21		X	186	8	
								B	$/metric ton			$1,100	$3.89		X			
5	Carbon disulfide		75-15-0	F005, P022		X	X	A	$/ton	$465	$485	$485	$1.89	X		18	18	
6	Carbon tetrachloride	Tetrachloromethane	56-23-5	D019, F001, U211	X	X	X							X		7	Small	X
7	Chlorobenzene		108-90-7	D021, F002, U037		X	X	A	$/pound	$0.38	$0.55	$0.55	$4.29	X		20	0	X
8	Chloroform	Trichloromethane	67-66-3	D022, U044	X	X	X	A	$/pound	$0.30	$0.45	$0.40	$3.08		X	12	0	
									$/metric ton			$550	$1.95		X			
9	o-Cresol		95-48-7	D023, F004		X	X							X		2	2	X
10	Cresylic acid		1319-77-3	D026, F004, U052		X	X	A	$/pound	$0.45	$0.80	$0.60	$4.68	X		13	2	
11	Cyclohexane		110-82-7	U056				A	$/gallon	$1.05	$1.44	$1.44	$1.44		X	195	0	
12	Cyclohexanone	Cyclohexyl ketone, Anone	108-94-1	F003, U057				B	$/pound			$0.54	$4.21	X		26	0.3	
13	o-Dichlorobenzene	1,2-Dichlorobenzene	95-50-1	F002, U070				A	$/pound	$0.45	$0.67	$0.67	$5.23	X		3	2	
14	Diethylene glycol (DEG)		111-46-6					C	$/pound	$0.20	$0.23	$0.23	$1.79		X	63	Unknown	
15	Dipropylene glycol (DIG)		25265-71-8					A	$/pound	$0.41	$0.69	$0.69	$5.38		X	20	0	
								B	$/pound			$0.65	$5.07		X			
16	Ethanol	Ethyl alcohol	64-17-5					A	$/gallon	$1.40	$3.00	$1.90	$1.90		X	1,053	55	
17	Ethyl acetate		141-78-6	F003, U112				A	$/pound	$0.37	$0.59	$0.59	$4.60	X		254	38	
								B	$/pound			$0.47	$3.67	X				
18	Ethylbenzene		100-41-4	F003				A	$/pound	$0.25	$0.25	$0.25	$1.95	X		Small	Small	
19	Ethyl ether		60-29-7	F003, U117										X		6	0	
20	Isobutanol	2-methyl-1-proponal, isobutyl alchohol	78-83-1	F005, U140				B	$/metric ton			$760	$2.69	X		125	0	
21	Isobutyl acetate		110-19-0					C	$/pound			$0.59	$4.60		X	69	0	
22	Isopropanol	Isopropyl alcohol, 2-propanol	67-63-0					A	$/pound	$0.20	$0.34	$0.34	$2.65		X	553	11	
								B	$/metric ton			$947	$3.35		X			
23	Isopropyl acetate		108-21-4					C	$/pound			$0.61	$4.76		X	58	5	
24	Methanol	Methyl alcohol	67-56-1	F003, U154		X	X	A	$/gallon	$0.28	$1.55	$1.55	$1.55	X		827	143	
								B	$/metric ton			$425	$1.50	X				
25	Methyl acetate		79-20-9												X	710	0	
26	Methyl chloride	Chloromethane	74-87-3	U045		X	X	A	$/pound	$0.28	$0.39	$0.39	$3.00		X	7	0	
27	Methyl ethyl ketone (MEK)	2-Butanone	78-93-3	D035, F005, U159		X	X	A	$/pound	$0.24	$0.46	$0.46	$3.59	X		155	24	X
								B	$/pound			$0.43	$3.35	X				
28	Methyl isobutyl ketone (MIBK)	4-methyl-2-pentanone, Hexone	108-10-1	F003, U161		X	X	A	$/pound	$0.35	$0.63	$0.63	$4.91	X		122	2	
								B	$/pound			$0.57	$4.45	X				
29	Methylene chloride	Dichloromethane	75-09-2	F001, F002, U080		X	X	A	$/pound	$0.40	$0.43	$0.42	$3.28	X		266	20	X
								B	$/pound			$0.27	$2.11	X				
30	Monoethylene glycol (MEG)	Ethylene glycol	107-21-1					C	$/pound	$0.15	$0.26	$0.26	$2.03		X	29	0	
31	Naphtha	Petroleum solvent; mineral spirits	8030-30-6												X	4,908	982	
32	Nitrobenzene		98-95-3	D036, F004, U169		X	X	A	$/pound	$0.30	$0.34	$0.34	$2.65	X		14	0	X
33	2-Nitropropane		79-46-9	F005, U171		X	X							X		Unknown	Unknown	X
34	n-propyl acetate		109-60-4					C	$/pound			$0.65	$5.07		X	61	0	
35	Pyridine		110-86-1	D038, F005, U196										X		2	0	X
36	Toluene		108-88-3	F005, U220		X	X	A	$/gallon	$0.66	$1.26	$1.11	$1.11	X		872	131	
37	Perchloroethylene (PERC)	Tetrachloroethylene	127-18-4	D039, F001, F002, U210	X	X	X	A	$/pound	$0.32	$0.35	$0.35	$2.73	X		300	45	X
								B	$/metric ton			$590	$2.09	X				
38	1,1,1-Trichloroethane (TCA)	Methyl chloroform	71-55-6	F001, F002, U226				B	$/metric ton			$1,750	$6.19	X		209	0	
39	Trichloroethylene (TCE)		79-01-6	D040, F001, F002, U228	X	X	X	A	$/pound	$0.60	$0.65	$0.60	$4.68	X		178	100	X
								B	$/pound			$0.38	$2.96	X				
40	1,1,2-Trichloro-1,2,2-trifluoroethane	CFC-113	76-13-1	F002										X		11	11	
41	Triethylene glycol (TEG)		112-27-6					B	$/metric ton			$940	$3.33		X	12	Unknown	
42	Turpentine	Gum or wood turpentine	9005-90-7					B	$/metric ton			$555	$1.96		X	243	Unknown	
43	Xylene (mixed isomers o-,m-,p-)	Dimethylbenzene	1330-20-7	F003, U239		X	X	B	$/metric ton			$495	$1.75	X		617	0	

A. Chemical Identity:				B. US Hazard Status:				C. US Average Price:								D. US Consumption:		
Item	Solvent Chemical Name	Synonyms	Cas Number	RCRA hazardous wastecode* (40 CFR 261)	Toxic Air Pollutant UAT	HAP1	HAP2	Price data source	Reference price basis	1994-99 price range Low	High	Current US avg price**	Current avg price standardized ($/gal)***	X if Fxxx	X if not Fxxx	1997 all solvent uses**** (mill lbs)	1997 solvents for cleaning & degrease (mill.lbs)	X if wipes landfill disposal ineligible
Price Data Summary:				Count =	5	18	18					Count =	47	29	18	35	21	11
												Min =	$0.75	$0.75	$1.44			$0.75
												Max =	$6.19	$6.19	$5.38			$4.68
												Std.dev =	$1.34	$1.38	$1.31			$1.29
												Midpoint =	$3.47	$3.47	$3.41			$2.72
												Mean =	$3.22	$3.17	$3.30			$3.14
												Median =	$3.28				% of cleaning/degreasing>	11%
												Skewness***** =	0.17	Total mill.lbs =		12,664.4	1,804.0	191.0
												Kurtosis***** =	-1.00	Mill.tons eqvlnt =		6.332	0.902	0.096
													Gallons equivalent *** (millions) =			1,623.6	231.3	24.5

Explanatory Notes:

! The chemicals listed above do not represent all chemicals used historically, currently, or in the future as solvents; there are at least 180 chemicals used as common industrial solvents (source: Kirk-Othmer "Encyclopedia of Chemical Technology", 4th ed., John Wiley & Sons Inc., Vol.22: "Solvents, Industrial" Table 2, 1998; http://www.wiley.co.uk/products/subject/reference/kirk_index.html).

! * RCRA wastecodes shown only as pertaining to chemicals in solvent applications; these chemicals may have other RCRA wastecodes associated with other industrial applications and sources.

! ** "Current" price represents year 1999 or 2000 price (if data Source A), or April 2001 price (if data Source B).

! *** $/pound and $/ton prices standardized to $/gallon common units, by applying an average pounds-per-gallon solvent specific gravity conversion factor = 7.8

! Price data sources:

Source A = http://www.chemexpo.com

Source B = http://www.allchem.com/products/price.html

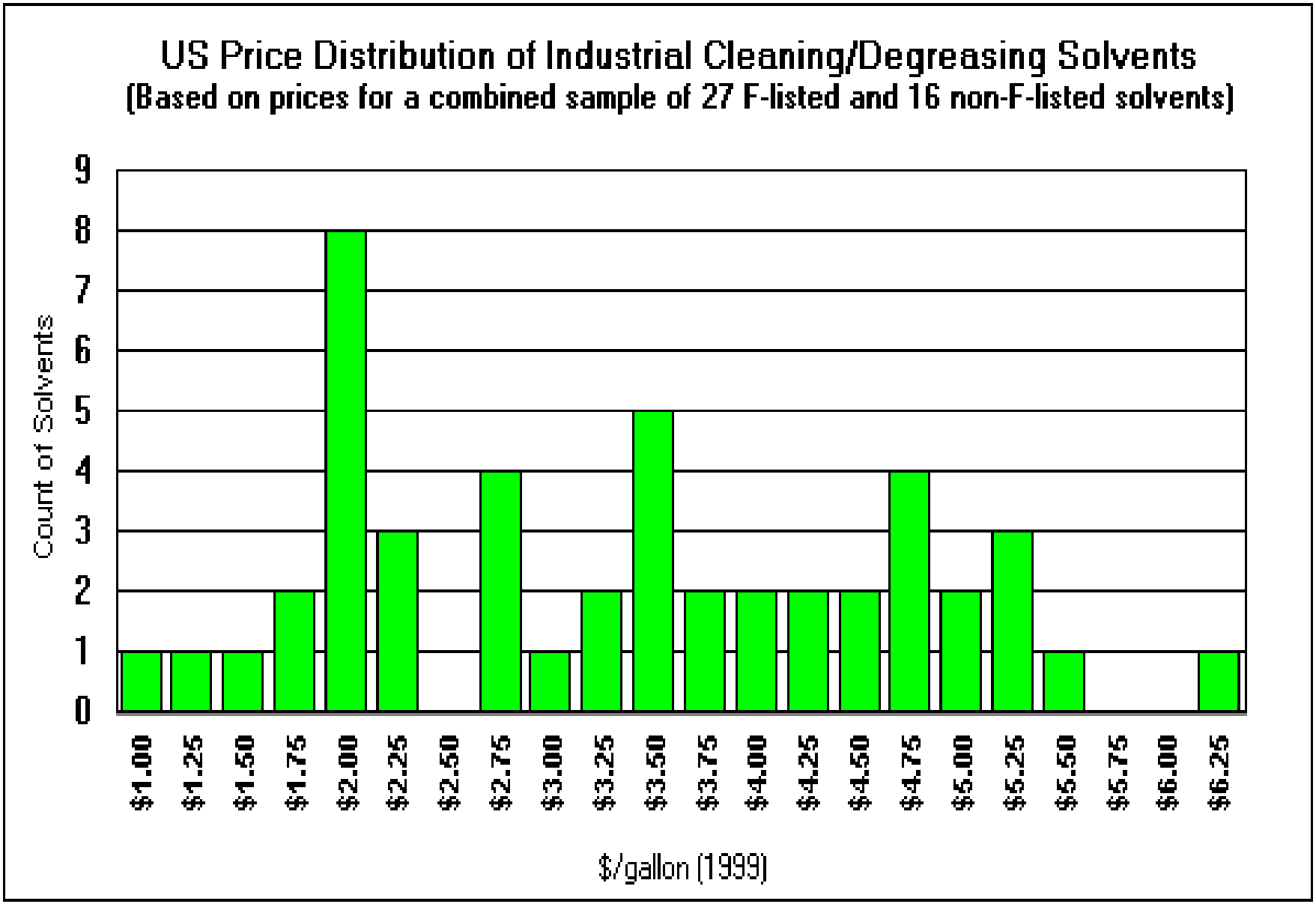
Source C = http://ceh.sric.sri.com

! UAT = urban air toxic (http://www.epa.gov/ttn/atw/urban/list33.html).

! HAP = hazardous air pollutant (HAP1= 1990 original Clean Air Act listing http://www.epa.gov/ttn/atw/orig189.html; HAP2= EPA 2001 revised listing http://www.epa.gov/ttn/atw/188polls.html)

! **** Consumption data source: Stanford Research Institute (SRI) "Chemical Economics Handbook" (http://ceh.sric.sri.com); other solvent uses include chemical production solvents and coatings/adhesives carrier solvents.

! **** Skewness (horizontal elongation in one direction) and kurtosis (vertical peakedness) are two complementary measures of the relative "normal" or "bell" shape of the numerical distributions implied by the price data in this table; normal distributions (i.e. bell-shaped curves) have skew =0 and kurtosis =0, and are symmetrical about the mean.


US Price Distribution of Industrial Cleaning/Degreasing Solvents
(Based on prices for a combined sample of 27 F-listed and 16 non-F-listed solvents)
Count of Solvents
0
1
2
3
4
5
6
7
8
9
$1.00
$1.25
$1.50
$1.75
$2.00
$2.25
$2.50
$2.75
$3.00
$3.25
$3.50
$3.75
$4.00
$4.25
$4.50
$4.75
$5.00
$5.25
$5.50
$5.75
$6.00
$6.25
$/gallon (1999)

CONSUMPTION OF INDUSTRIAL SOLVENT CHEMICALS FOR CLEANING/DEGREASING OPERATIONS IN THE US ECONOMY (1997*)										
							RCRA haz waste status (40 CFR 261)****			
Item	CAS Nr.	Industrial Solvent (chemical name)	All solvent uses** (mill lbs)	Cleaning degreasing solvents*** (mill.lbs)	X if wipes landfill disposal ineligible	Cumula-tive %	Waste as contained-in constituent	Waste as used solvents	Waste as dis-carded/ spilled solvent	40 CFR 268.48 RCRA haz waste non-wastewater UTS (ppm)*****
1	8030-30-6	Naphtha	4,908	982		54.4%				No numerical UTS
2	67-64-1	Acetone	420	187		64.8%		F003		160
3	67-56-1	Methanol	827	143		72.7%		F003		0.75 TCLP
4	108-88-3	Toluene	872	131		80.0%		F005	U220	10
5	79-01-6	Trichloroethylene (TCE)	178	100	X	85.5%	D040	F001, F002	U228	6
6	64-17-5	Ethanol	1,053	55		88.6%				No numerical UTS
7	127-18-4	Perchloroethylene (PERC)	300	45	X	91.1%	D039	F001, F002	U210	6
8	141-78-6	Ethyl acetate	254	38		93.2%		F003		33
9	78-93-3	Methyl ethyl ketone (MEK)	155	24	X	94.5%	D035	F005	U159	36
10	75-09-2	Methylene chloride	266	20	X	95.6%		F001, F002	U080	30
11	71-36-3	n-butanol	18	18		96.6%		F003		2.6
12	75-15-0	Carbon disulfide	18	18		97.6%		F005	P022	4.8 TCLP
13	67-63-0	Isopropanol	553	11		98.2%				No numerical UTS
14	76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	11	11		98.8%		F001, F002		30
15	123-86-4	n-butyl acetate	186	8		99.3%				No numerical UTS
16	108-21-4	Isopropyl acetate	58	5		99.5%				No numerical UTS
17	108-10-1	Methyl isobutyl ketone (MIBK)	122	2		99.6%		F003		33
18	1319-77-3	Cresylic acid	13	2		99.8%		F004	U052	No numerical UTS
19	95-50-1	o-Dichlorobenzene	3	2		99.9%		F002	U070	6
20	95-48-7	o-Cresol	2	2	X	100.0%	D023	F004		5.6
21	108-94-1	Cyclohexanone	26	0.3		100.0%		F003		0.75 TCLP
22	9005-90-7	Turpentine	243	Unknown		100.0%				No numerical UTS
23	111-46-6	Diethylene glycol (DEG)	63	Unknown		100.0%				No numerical UTS
24	112-27-6	Triethylene glycol (TEG)	12	Unknown		100.0%				No numerical UTS
25	56-23-5	Carbon tetrachloride	7	Small	X	100.0%	D019	F001	U211	6
26	100-41-4	Ethylbenzene	Small	Small		100.0%		F003		10
27	79-20-9	Methyl acetate	710	0						No numerical UTS
28	1330-20-7	Xylene (mixed isomers o-,m-,p-)	617	0				F003		30
29	71-55-6	1,1,1-Trichloroethane (TCA)	209	0				F001, F002	U227	6
30	110-82-7	Cyclohexane	195	0						No numerical UTS
31	78-83-1	Isobutanol	125	0				F005	U140	170
32	110-19-0	Isobutyl acetate	69	0						No numerical UTS
33	109-60-4	n-propyl acetate	61	0						No numerical UTS
34	107-21-1	Monoethylene glycol (MEG)	29	0						No numerical UTS
35	25265-71-8	Dipropylene glycol (DIG)	20	0						No numerical UTS
36	108-90-7	Chlorobenzene	20	0	X		D021	F002	U037	6
37	98-95-3	Nitrobenzene	14	0	X		D036	F004	U169	14
38	67-66-3	Chloroform	12	0			D022		U044	6
39	74-87-3	Methyl chloride	7	0					U045	No numerical UTS
40	60-29-7	Ethyl ether	6	0				F003		160

Item	CAS Nr.	Industrial Solvent (chemical name)	All solvent uses** (mill lbs)	Cleaning degreasing solvents*** (mill.lbs)	X if wipes landfill disposal ineligible	Cumula-tive %	RCRA haz waste status (40 CFR 261)****			40 CFR 268.48 RCRA haz waste non-wastewater UTS (ppm)*****
							Waste as contained-in constituent	Waste as used solvents	Waste as dis-carded/ spilled solvent	
41	110-86-1	Pyridine	2	0	X		D038	F005	U196	16
42	71-43-2	Benzene	Small	0	X		D018	F005	U019	10
43	79-46-9	2-Nitropropane	Unknown	Unknown	X			F005	U171	No numerical UTS
Column Summaries:		Count =	43		11	Ineligible	10	27	18	
		Million pounds =	12,664.4	1,804.0	191.0	11%	690.0	4,485.0	2,201.0	
		Million tons equivalent =	6.332	0.902	0.096	% of	0.345	2.243	1.101	
		Million gallons equivalent =	1,623.6	231.3	24.5	cleaning	88.5	575.0	282.2	
		Percentage of all solvents use annual quantity (w/data) =	100%	14%	2%	solvents	5%	35%	17%	

Explanatory Notes:

! * Source: Stanford Research Institute (SRI) "Chemical Economics Handbook" (http://ceh.sric.sri.com).
This list of chemicals used as solvents does not represent all such chemicals, only those solvents with SRI-CEH data.
The US produced at least 54,089 million pounds (27.044 million tons) of 43 solvents in 1991 (Kirk-Othmer, "Encyclopedia of Chemical Technology, 4th ed., John Wiley & Sons Inc., Vol.22: "Solvents, Industrial" Table 5, 1998; http://www.wiley.co.uk/products/subject/reference/kirk_index.html).

! ** "All solvent use" quantities do not include other possible chemical uses, such as feedstocks for chemical manufacturing.

! *** Cleaning/degreasing quantities include other cleaning/degreasing applications, in addition to industrial wipes.

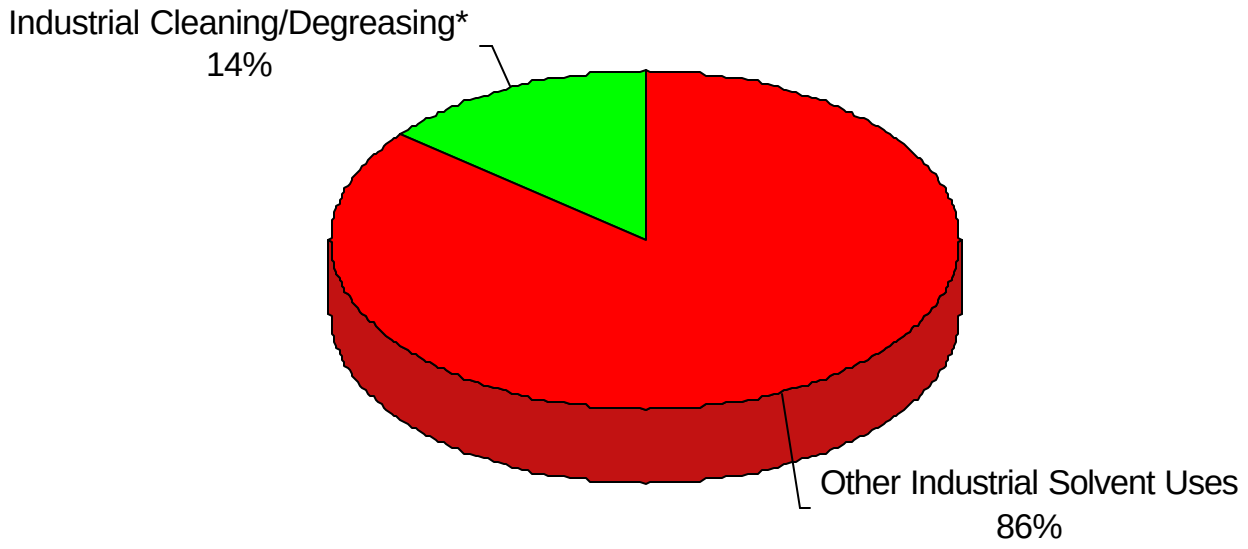
! **** RCRA hazardous waste status according to whether a chemical is the basis for a hazardous waste "toxicity characteristic" (D004 to D043) or a "listed" hazardous waste (Fxxx, Kxxx, Pxxx acutely hazardous, Uxxx); in addition, hazardous wastes may be ignitable (D001), corrosive (D002), or reactive (D003); see 40 CFR 261 Subpart C and Subpart D for definitions of RCRA hazardous waste codes. F001 to F005 pertain to spent solvents.
-- Dxxx wastecodes pertain generically to all types of economic uses, processes, and products, unless otherwise exempt/ excluded from RCRA waste regulation. A chemical in pure form may be ignitable (e.g. naptha), corrosive, or reactive, but it's the entire waste matrix which determines whether a waste is D001, D002, D003.
-- F001 to F005 wastecodes pertain to spent solvents used in degreasing and other solvent applications.
-- Pxxx and Uxxx wastecodes pertain to these solvents when discarded or off-specification commercial products, or in container or spill residues.

! ***** UTS = "Universal Treatment Standards"; all hazardous constituents in a RCRA-listed waste (or waste treatment residue) must be at or below the values found in the RCRA treatment standards of 40 CFR 268 Subpart D.

! TCLP = "Toxicity Characteristic Leaching Procedure" chemical concentration analysis method (see 40 CFR 261.24).

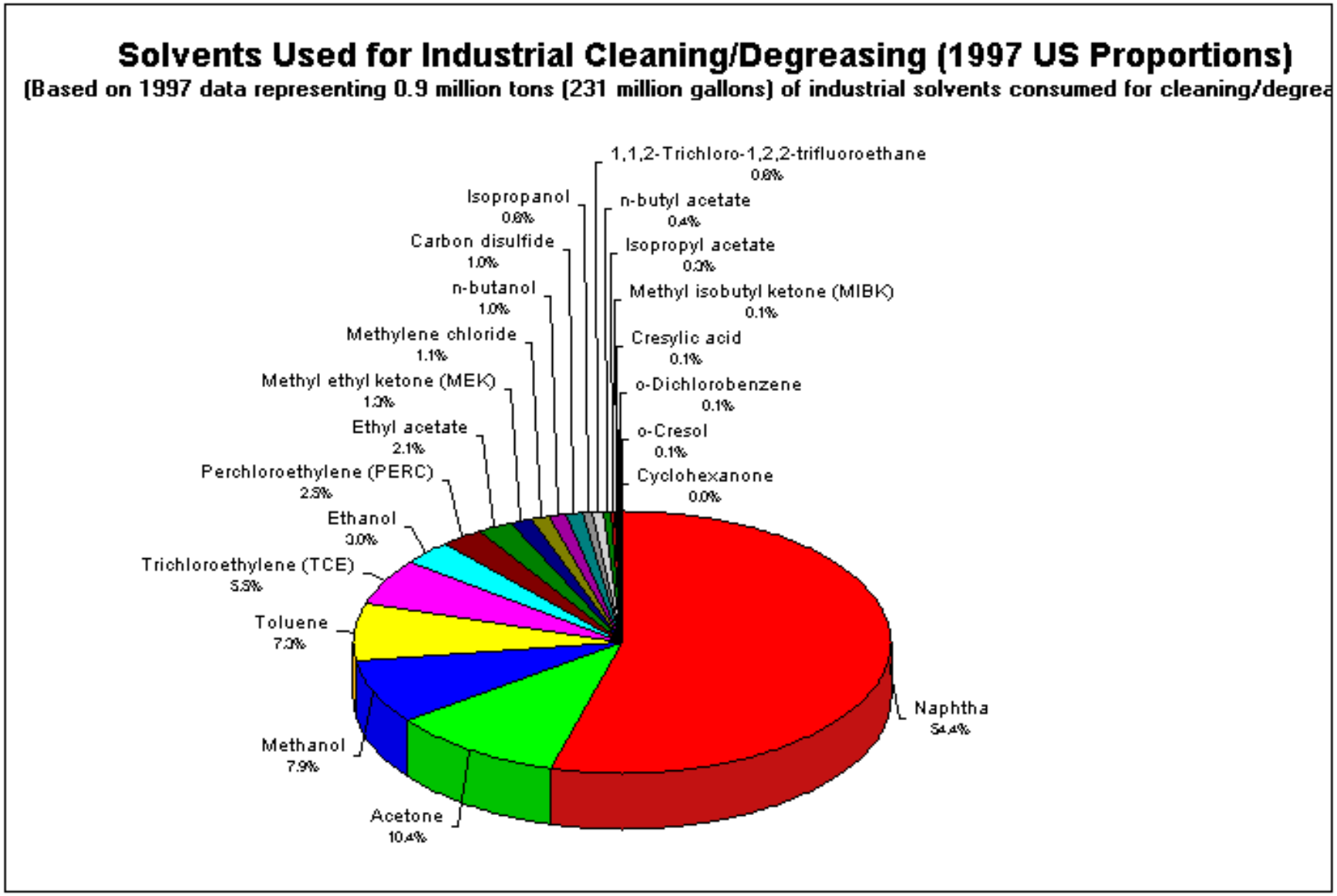
Solvents Used for Industrial Cleaning/Degreasing, Compared to Other Industrial Solvent Uses (1997 US Proportions)

(Based on 1997 data representing 6.3 million tons (1.62 billion gallons) industrial solvent consumption)



* Note: Solvents Applied to Industrial Wipes Represents a Small Fraction of Cleaning/Degreasing.

Pie-Chart Summary of Previous Spreadsheet



Attachment Set D

Price-Elasticity of Demand for Industrial Wipes: Results of Meta-Analysis

Price Elasticity of Demand for Industrial Wipes:
Meta-Analysis of Internet-Published Economic Studies
to Collect and Analyze Empirical Data on Own- and Cross-Price Elasticities of Demand

A. Meta-Analysis Study Overview:

! Background: As presented in a prior section in this document, OSW-EMRAD computed an indicator to use as the own-price elasticity for reusable wipes, based on US historical annual data (1978-1993) on pounds and revenue of all items laundered at industrial laundries. However, we did not obtain comparable disposable wipes market data for developing a cross-price elasticity indicator. Consequently, conducted a meta-analysis study of price elasticity data published in other economic studies, because the "partial equilibrium" market model descriped and applied elsewhere in this document requires estimates of both "own" and "cross" price elasticities as inputs into the mathematical modeling of potential "induced impacts" of the rule on the US national market for reusable and disposable wipes.

! Meta-analysis: A research technique which involves collecting and analyzing information or data on a single research topic or parameter of interest (e.g. data variable or numerical factor) from a sample of published sources. Meta-analysis is a type of comparative analysis method by which the data, information or results of different studies or cases may be compared. This technique is relatively widely applied in the fields of medicine, sociology, and psychology, but less wide-spread in the field of economics research. For a historical overview and "pros" and "cons" of meta-analysis as applied in economics research, see http://www.cpb.nl/eng/cpbreport/2002_2/s4_1.pdf. Three recent publications (1998-2000) also provide information about this research technique applied within the field of environmental economics: J. van den Bergh, K. Button, P. Nijkamp, G. Pepping, Meta-Analysis in Environmental Economics, Kluwer Academic Publishers, 1998; K. Button, S.M. Jongma, & J. Kerr, "Meta-Analysis Approaches and Applied Microeconomics," International Journal of Development Planning Literature, Vol.14, Nr.1, 1999, pp.73-103; and R. Florax, P. Nijkamp, K. Willis (eds.), Meta-Analysis and Research Synthesis in Environmental Policy, Edward Elgar Publishing, 2000.

! Objective: To search the internet for published economic studies containing empirical data on both own- and cross-price elasticities of demand:

- ! Own-price elasticity : Equal to the percentage change in the demand for product 1, divided by the percentage change in the price of product 1. For example, an own-price elasticity of -0.5 for product 1 implies that the demand for product 1 decreases by 0.5% for every +1% increase in its own price.

- Cross-price elasticity: Equal to the percentage change in the demand for product 1, divided by the percentage change in the price of product 2. For example, a cross-price elasticity of +0.5 for product 1 implies that the demand for product 1 increases by 0.5% for every +1% increase in the price of product 2 (products with cross-price elasticities >0 are "substitutes", products with <0 are "complements", and products =0 are "unrelated").

- Purpose: In absence of actual market research on the relative price/quantity or price-elasticity data for the US industrial wipes market, the purpose of this internet search was to derive an empirically-based, demand elasticity factor to apply in this "Economics Background Document", for purpose of modelling induced impacts on the industrial wipes market resulting from changes in the relative price of "disposable" and "reusable" industrial wipes, caused by differential direct impacts of the proposed rule on these two industrial wipes categories.

B. Meta-Analysis Study Scope:

- The scope of this search was not limited to industrial wipes, because did not locate any internet-published economic studies containing demand elasticity data for either reusable or disposable industrial wipes.

- Consequently, collected demand elasticity data from a variety of product market studies.

- Conducted the internet search in June 2001, using the following internet browser search terms to locate potentially relevant studies:
  "own" "cross" "price" "elasticity" "demand"

C. Internet Search Findings for Price Elasticity Data:

- The internet search produced a "hit-list" of over 17,000 weblinks. Scrolled through the first 2,000 to 4,000 of the weblinks on the hit-list to search for studies that appeared to contain relevant data, based on the brief internet browser descriptions for each weblink.

- Skipped-over many weblinks from this search, such as those which appeared to provide only definitions of own- and cross-elasticities (e.g. university course weblinks), rather than actual empirical data (paired data) from specific product markets.

- Only collected data if own-elasticity was <0 (represents a "normal" good), and the associated cross-elasticity was >0 (served to restrict

the data collection only to product "substitutes" — as reusable and disposable wipes are to some degree --- rather than "complementary" products).

- Did not attempt to differentiate between "short-term" and "long-term" elasticity data.

- Discontinued searching the hit-list after encountering repeated occurrences of studies involving product markets matching prior weblinks.

- This elasticity data collection approach represents a type of "*non-probability*" sampling method, which limits the validity of attempting to generalize (apply) the findings to other products/markets such as industrial wipes. This internet study represents a relative low-cost and fast method for operationalizing a parameter in absence of other specific data. Application of an uncertainty range to the value assigned this parameter, as described below, serves to acknowledge this explicit limitation.

D. Results of Price Elasticity Data Collection & Meta-Analysis:

- Compared data from 17 studies (a following page in this document presents a bibliography).

- Data comparison made by computing the ratios of the numerical values (absolute values) of own-price to cross-price elasticities for each data pair.

- Because of the ranges in elasticity values and skewed distributions in elasticity ratios, median values used as central tendency indicators for this study.

- Data collected for 460 sets of own- and cross-price elasticity data pairs:
  - Own-price elasticities (negative) findings: -0.049 to -12.62 (median = -2.5)
  - Cross-price elasticities (positive) findings: +0.0001 to +2.011 (median = +0.057)
  - Paired-data elasticity ratios (absolute value own:to:cross x 100) findings: 0.001% to 95.72% (median = 2.1%)

- Data represent seven economic sectors: food & beverages, services, transportation, manufacturing operations, chemical products, energy, agriculture.

- Data represent 26 products/markets: paints (solvent-borne, water-borne), pesticides, breakfast cereals, postal cards, grocery milk (whole/skim), grocery fruit, school tuition (public/private), beverages, automobiles, building energy (fuel, natural gas, electricity, coal), animal husbandry, telephones, telecommunications service providers, personal computers (desktop/laptop). Data-pairs in each

product/market grouping ranged from one to 72 data-pairs; the median values of the 26 grouped data-pairs are:

- Paired-data elasticity ratios (absolute value own:to:cross x 100) findings: 0.3% to 95.3% (median = 26.4%)

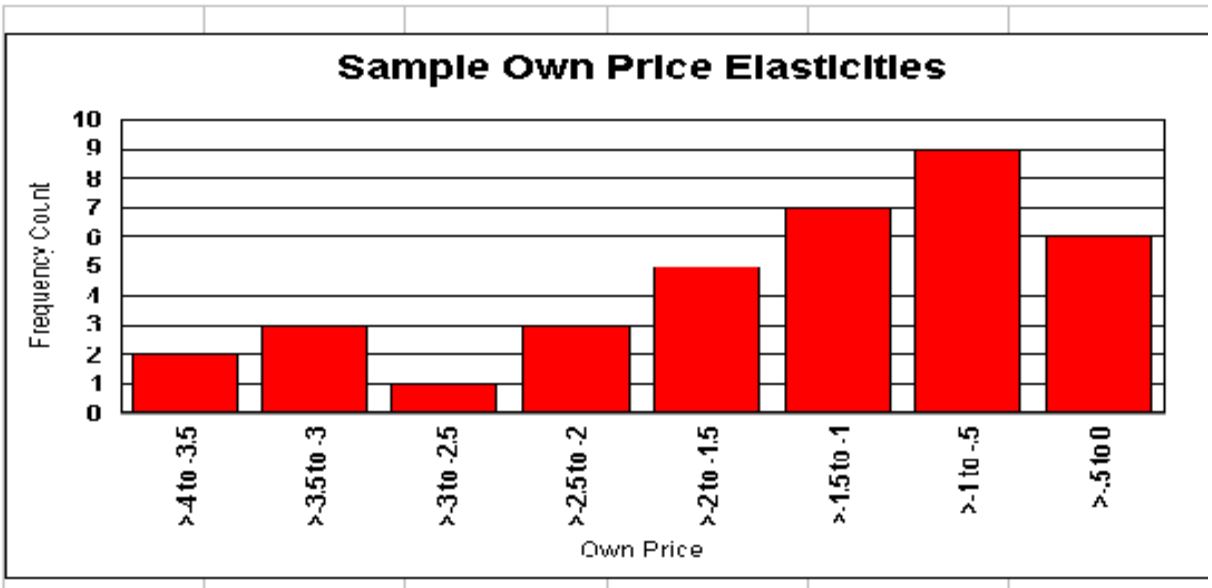
- Values assigned in the industrial wipes economic analysis for simulating possible induced market effects:

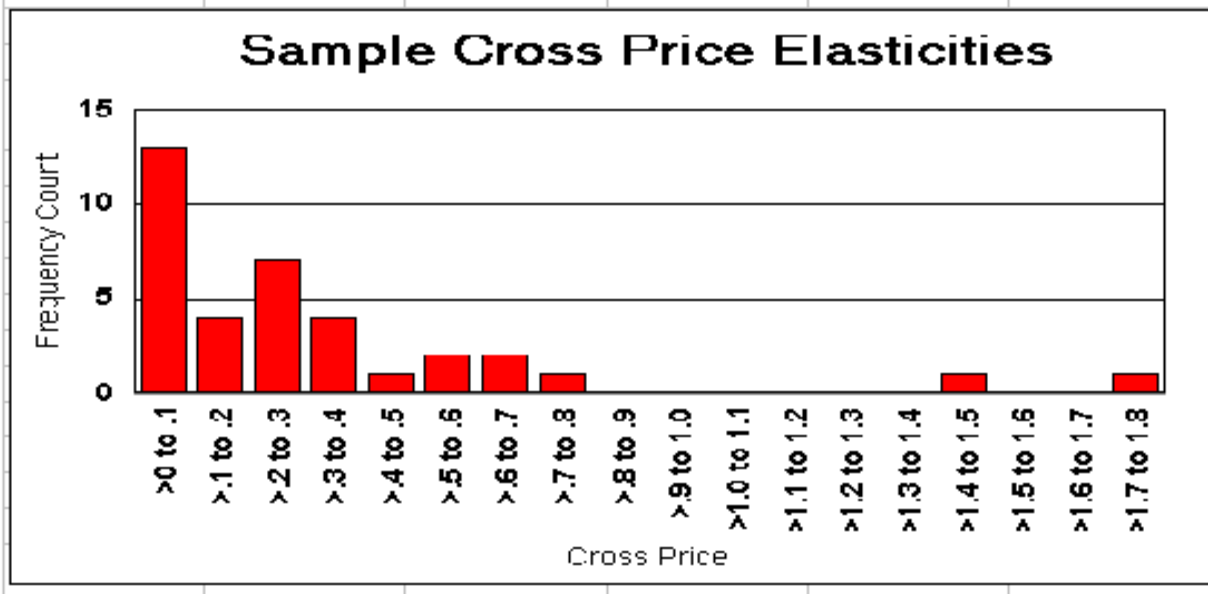
  - Most-likely value: To reduce redundancy over-weighting of products in the data sample, applied the **26% median value** based on the product grouping aggregation, as the "*most-likely*" empirical value in this "Economics Background Document".

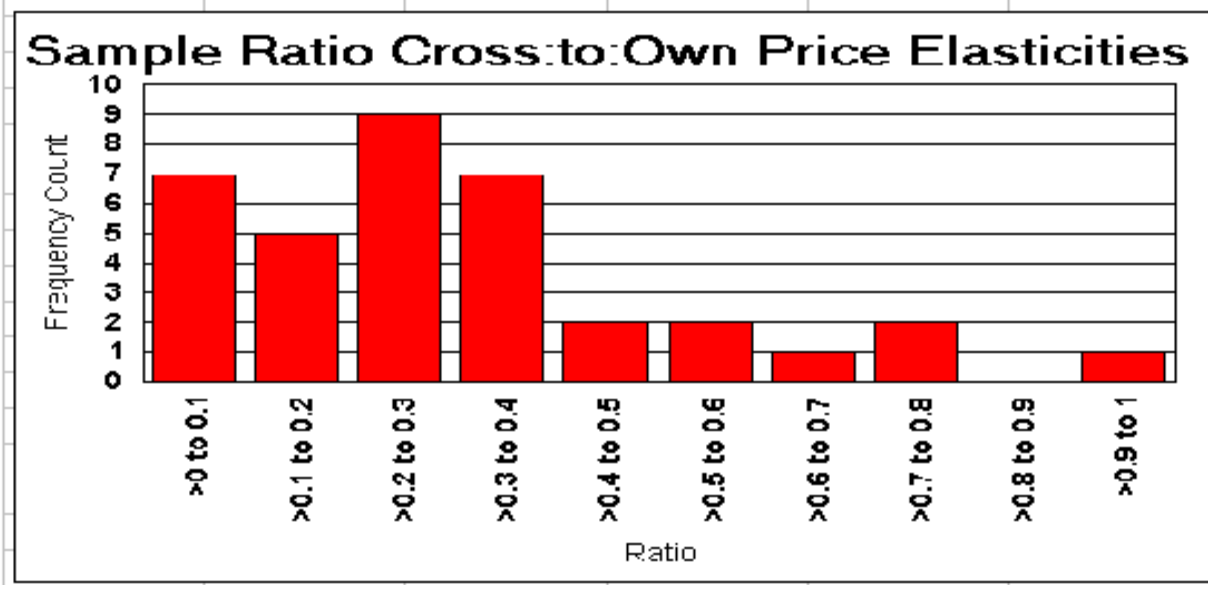
  - Upper-bound value: The *most-likely* value also constituted the "*upper-bound*" value in the sensitivity analysis for this parameter, because values >26% would represent easier substitution between reusable and disposable wipes, which is reportedly not the case because of wipes performance characteristics preferences by most industrial users (e.g. wipes durability, wipes lint, wipes absorbency).

  - Lower-bound value: Applied **11%** as the "*lower-bound*" value to represent more restricted wipes substitution scenario, derived from two standard deviations* below the median (26.4% - (2 x 7.4%) = 11%). [*According to the statistical "*Empirical Rule*" of mound-shaped (approximately symmetric) frequency distributions, about 95% of the measurements within a range will fall within +/- two standard deviations of the mean.]

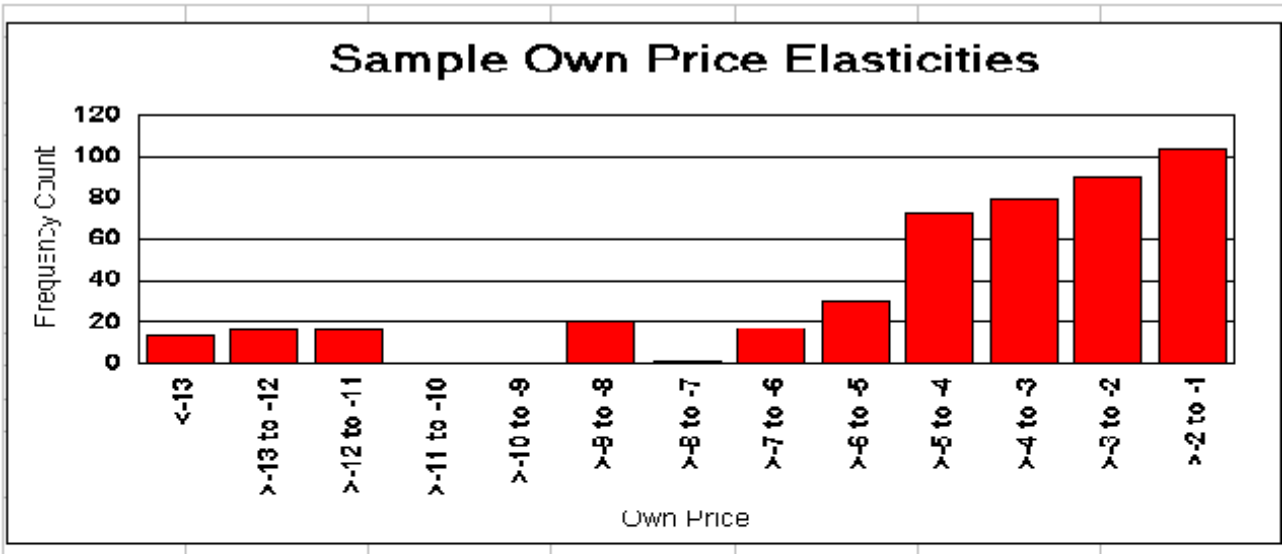
Price Elasticity Summary by Commodity Groups (median values, n = 36 datapoints)

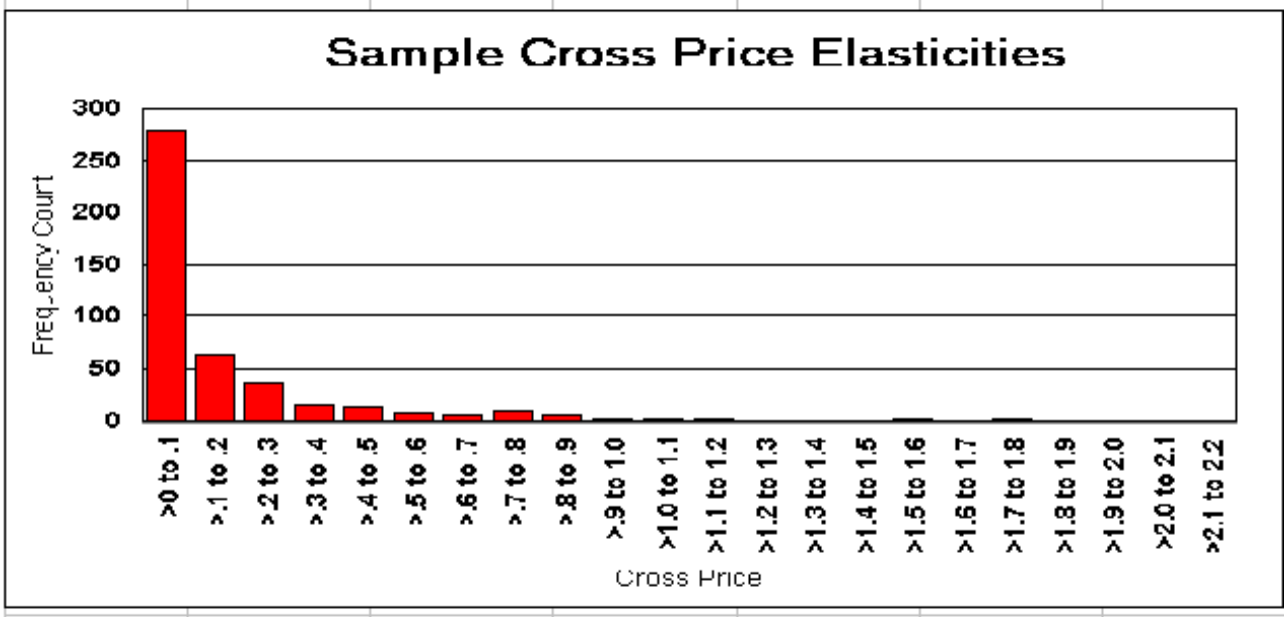


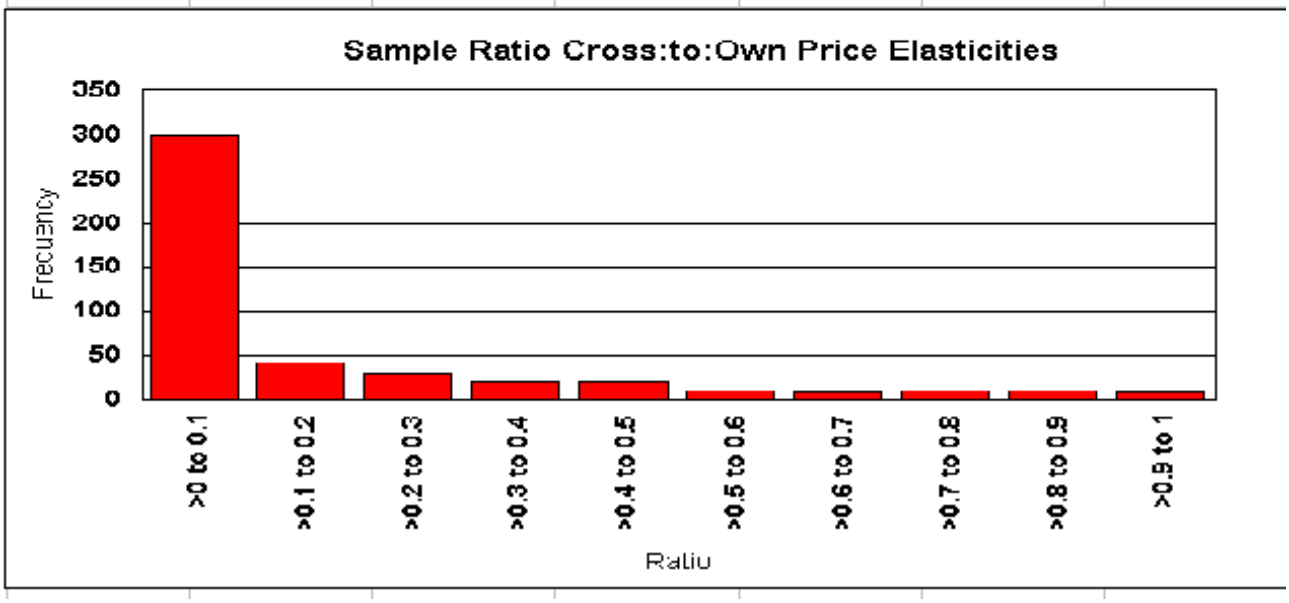




Price Elasticity Summary for All Data Collected in Study (n = 420 datapoints)







Findings of USEPA-OSW June 2001 Internet Search for Economic Studies
Containing Both Own- and Cross-Price Elasticity Data
(Results of a Non-Probability Purposive Sampling Approach)

1. "Appendix A: Market Definition, Demand Estimation, and Data" in Economic Impact and Regulatory Flexibility Analyses of the Final Architectual Coatings VOC Rule". EPA-452/R- 98-002, Office Air-Quality Planning and Standards, July 1998, http://www.epa.gov/ttn/uatw/183e/aim/appa.pdf

2. "Committee on Commodity Problems Sub-Group on Tropical Fruits", Pattaya, Thailand, May 1998, http://www.fao.org/UNFAO/Bodies/ccp/sgtf/98/TF98-3E.HTM

3. "Response of United States Postal Service Witness Tolley to Interrogatories of the Newspaper Association of America", Docket Section, Postal Rate and Fee Changes, 1997, 24pp., http://www.prc.gov/docs/5/5099/rsp-naa-usps-t6.pdf

4. Agbola, Frank Wogbe, "The Structure of Production and Investment in Australia's Pastoral Zone", January 2001, http://www.curtin.edu.au/curtin/muresk/publications/invest.htm

5. Agne, Stefan, "The Impact of Pesticide Taxation on Pesticide Use and Income in Costa Rica's Coffee Production", March 2000, 241 pp., http://www.ifgb.uni-hannover.de/institut/projekte/gtz/ppp_s02.pdf

6. Glick Peter and Sahn David, "The Demand for Primary Schooling in Rural Madagascar: Price, Quality, and the Choice Between Public and Private Providers", Cornell University Food and Nutrition Policy Program, September 2000, 47 pp., http://mango.human.cornell.edu/cfnpp/images/wp113.pdf

7. Gould, Brian W., " Factors Affecting U.S. Demand for Reduced-Fat Milk", University of Wisconsin-Madison, October 1995, 30 pp., http://www.aae.wisc.edu/www/pub/sps/stpap386.pdf

8. Irwin, Douglas and Nina Pavcnik, "Airbus versus Boeing Revisited: International Competition in the Aircraft Market", May 2001, 37pp., http://www.dartmouth.edu/~npavcnik/Research_files/airbus.pdf

9. Larivière Éric, Larue Bruno, and Chalfant James, "Modeling the Demand for Alcoholic Beverages and Advertising Specifications", Universite Laval, April 1998, 37 pp., http://alpha.eru.ulaval.ca/crea/PUBLICATIONS/larue/SR-98-02.PDF

10. Martin, Will, "Reducing Carbon Dioxide Emissions through Joint Implementation of Projects", Development Research Group, World Bank, April 1998, 26 pp., http://econ.worldbank.org/docs/1113.pdf.

11. Nevo, Aviv, "Mergers With Differentiated Products: The Case of the Ready-To-Eat Cereal Industry",University of California, Berkeley, November 1997, 59 pp., http://www.haas.berkeley.edu/groups/cpc/WPs/99-2.pdf

12. Patterson Paul and Richards Timothy, "Print Advertisement Characteristics and Apple Variety Attraction: A MIMIC Model Approach", Arizona State University, April 1998, 33 pp., http://www.east.asu.edu/msabr/research/workingpapers/msabr9803_print.pdf

13. Ramaswamy K.V.,R.R Vaidya , M.J. Bennis and J.G.M. Hoogeveen, "Input Substitution in the Indian Paper Industry: a Variable Cost Function Approach", CREED Working Paper No 7, July 1996, 25 pp., http://www.iied.org/pdf/creed07e.pdf

14. Slade, Margaret E., "Assessing Market Power in UK Brewing", Journal of Economic Literature, March 2001, 53pp., http://www.arts.ubc.ca/econ/discpapers/DP0104.PDF

15. Stavrev, Emil and Gueorgui Kambourov, "Share Equations versus Double Logarithmic Functions in the Estimation of Income, Own-and Cross-Price Elasticities: An Application for Bulgaria", Transition Economics Series, March 1999, 19 pp, http://www.ihs.ac.at/publications/tec/te-7.pdf

16. Viard, B., N. Polson, A. Gron, "Solving for Market Equilibrium Using Random Coefficient Random Utility Models", May 2000, 38 pp., http://faculty-gsb.stanford.edu/viard/personal/PDF/equil.pdf

17. Wade, Steven H., " Price Responsiveness in the NEMS Buildings Sector Model", Energy Information Administration, Office of Integrated Analysis and Forecasting, http://www.eia.doe.gov/oiaf/issues/pricetbl1.html

Attachment Set E

Direct Impact Elements

Private Sector Labor Wage Rates (Year 2001 US national averages)
Derivation of Benefits- and Overhead-Loaded Wage Rates

Item	Occupational Category	BLS Standard Occupa-tional Code	A 1999 median non-loaded wage rate ($/hour)	B Total benefits* multiplier	C Benefitted wage rate overhead** multiplier	D (AxBxC) 1999 Loaded wage rate ($/hour)	E Year 2001 update multiplier	F (D x E) 2001 Loaded wage rate ($/hour)
1	Clerical (general office)	43-9061	$9.77	1.354	1.219	$16.12	1.119	$18.05
2	Technical (production industries)	51-9061	$11.68	1.354	1.219	$19.28	1.119	$21.58
3	Managerial (production industries)	51-1011	$18.61	1.354	1.219	$30.71	1.119	$34.38
4	Legal (lawyers)	23-1011	$42.81	1.354	1.219	$70.65	1.119	$79.09
5	Janitors & cleaners (except maids/housecleaners)	37-2011	$7.90	1.435	1.219	$13.82	1.119	$15.47

Explanatory Notes:

(a) * Total benefits as defined/measured in the BLS "Employment Cost" database include:

(1) Paid leave (vcation, holiday, sick, other)
(2) Supplemental pay (premium, shift differentials, non-production bonuses)
(3) Insurance (life, health, short-term disability, long-term disability)
(4) Retirement &savings (defined benefit, defined contribution)
(5) Legally required benefits (social security, OASDI, medicare, Federal & state unemployment insurance, worker's compensation)
(6) Other benefits

(b) ** Overhead: proportionate share of management and office support costs (e.g. office rent, office equipment, office utilities).

(c) Data sources:

Column A: 1999 non-loaded wage rates: US Dept of Labor, Bureau of Labor Statistics (http://www.bls.gov/oes/1999/)

Column B: Benefits multiplier: US Dept of Labor, Bureau of Labor Statistics (http://www.bls.gov/news.release/ecec.t06htm).

Items 1 to 4: based on private industry white collar workers (national average).
Item 5: based on private industry blue collar workers (national average).

Column C: Average of three case studies (4 cases) provided in two US EPA full cost accounting reports for solid/hazardous waste management:

Case data elements (dept annual totals all labor)	Case A1	Case A2	Case B	Case C	Average
Base labor wages/salaries	$843,046	$843,046		$3,038,226	
Labor benefits	$291,467	$291,467		$1,481,576	
Benefits-loaded wages	$1,134,513	$1,134,513	$11,964,368	$4,519,802	
Implied benefits multiplier (relative to base wages) =	1.346	1.346		1.488	1.393
Administrative (office) overhead	$598,279	$257,998	$1,029,220	$157,223	
Total loaded wages	$1,732,792	$1,392,511	$12,993,588	$4,677,025	
Implied overhead multiplier (relative to base wages) =	1.710	1.306		1.052	1.356
Implied overhead multiplier (relative to benefit-load wage)	1.527	1.227	1.086	1.035	1.219
Implied composite multiplier (benefits + overhead) =	2.055	1.652		1.539	1.749

Case A: USEPA, "Full Cost Accounting in Action: Case Studies of Six Solid Waste Management Activities", EPA-530-R-98-018, Dec 1998, p.13. Case A1 represents inclusion of the full-set of 24 administrative operating cost items listed in the Case A study (e.g. as may be representative of white collar overhead associated with RCRA LQG regulatory burden, or with large company white collar occupations). Case A2 represents a subset of 13 cost items from Case A (i.e. excluding business travel, motor pool, dues/ memberships, subscriptions, and overhead cost from other depts); Case A2 may be representative of white collar overhead associated with RCRA SQG regulatory burden or with small company white collar occupations, or representative of overhead associated with blue collar occupations.

Case B: ibid, Table 10, page 34.

Case C: USEPA, "Full Cost Accounting for Municipal Solid Waste Management: A Handbook", EPA-530-R-95-041, Sept 1997, Exhibit 4-6, page 40.

Column E: "Employment Cost Index" for private industry, US Dept of Labor, Bureau of Labor Statistics (http://www.bls.gov/news.release/eci.nr0.htm):

	June 1999	June 2000	June 2001	
12-month % change in private industry wages & salaries =	3.6%	4.1%	3.8%	1.119 <Implied 1999 to 2001 multiplier

READ & DISSEMINATE FINAL RULE AFTER PROMULGATION: UNIT COST ASSUMPTIONS*			
Item	Computation Element	SQG	LQG
A. ALL INDUSTRIAL WIPES USERS: read rule or read summary of rule**			
1	Avg number persons per facility who intially read rule**>	1	3
2	Average hours per person to access and read initially>	0.25	0.25
3	Avg hourly wage (manager or legal or technical staff)>	$45	$45
4	Per facility cost initially to read rule (items 1x2x3)>	$11	$34
B. ONLY SOLVENT INDUSTRIAL WIPES USERS: disseminate rule requirements			
5	Avg nr. persons per facility who disseminate eligibility requirements>	1	3
6	Average hours per person to disseminate eligibility requirements>	0.5	0.5
7	Avg hourly wage (manager or legal or technical staff)>	$45	$45
8	Per facility cost initially to read rule (items 5x6x7)>	$23	$68

Explanatory Notes:

(a) * Assumptions in this table based on judgement by OSW staff.

(b) ** Or otherwise read a second-hand sysnopsis of the rule (e.g. trade journal newsletter article).

(c) NA= CESQGs are exempt from RCRA regulations (and the proposed rule).

READ & DISSEMINATE RULE: ESTIMATE OF NATIONAL COST									
Item	Sub-sector	B. ONLY SOLVENT INDUSTRIAL WIPES USERS & HANDLERS:							
		B1. Facilities Using Solvent Wipes:				B2. One-Time Cost to Facilities:			
						NA	$23	$68	<Unit costs
		CESQGs	SQGs	LQGs	Totals	CESQGs	SQGs	LQGs	Totals
DISPOSABLE INDUSTRIAL WIPES:									
1	Printing	NA	2,970	41	3,012	NA	$66,862	$2,801	$69,663
2	Chemical & Allied Products	NA	444	60	504	NA	$9,996	$4,066	$14,062
3	Plastics & Rubber	NA	570	45	615	NA	$12,823	$3,043	$15,865
4	Fabricated Metal Products	NA	2,146	94	2,240	NA	$48,310	$6,346	$54,656
5	Industrial Machinery & Eqpt	NA	1,066	21	1,086	NA	$23,989	$1,393	$25,382
6	Electronics & Computers	NA	197	46	243	NA	$4,430	$3,133	$7,563
7	Transportation Eqpt	NA	422	68	489	NA	$9,492	$4,564	$14,056
8	Furniture & Fixtures	NA	721	15	736	NA	$16,223	$1,038	$17,261
9	Auto Dealers (retail trade)	NA	1,678	100	1,778	NA	$37,769	$6,728	$44,498
10	Publishing (printed matter)	NA	1,506	24	1,530	NA	$33,897	$1,653	$35,550
11	Business services (copy shops)	NA	398	8	406	NA	$8,949	$545	$9,494
12	Auto Repair & Maintenance	NA	5,766	4	5,770	NA	$129,776	$280	$130,056
13	Military Bases	NA	17	7	24	NA	$383	$450	$833
	Subtotals =	NA	17,899	534	**18,433**	NA	$402,901	$36,039	**$438,940**
								Annualized cost =	$58,407
REUSABLE INDUSTRIAL WIPES:									
1	Printing	NA	39,355	550	39,904	NA	$885,833	$37,108	$922,941
2	Chemical & Allied Products	NA	5,883	798	6,681	NA	$132,430	$53,872	$186,302
3	Plastics & Rubber	NA	7,547	597	8,144	NA	$169,883	$40,310	$210,193
4	Fabricated Metal Products	NA	28,435	1,245	29,680	NA	$640,039	$84,073	$724,113
5	Industrial Machinery & Eqpt	NA	14,120	273	14,393	NA	$317,822	$18,460	$336,282
6	Electronics & Computers	NA	2,608	615	3,222	NA	$58,696	$41,503	$100,199
7	Transportation Eqpt	NA	5,587	895	6,482	NA	$125,754	$60,465	$186,219
8	Furniture & Fixtures	NA	9,549	204	9,752	NA	$214,934	$13,751	$228,684
9	Auto Dealers (retail trade)	NA	22,231	1,320	23,551	NA	$500,391	$89,142	$589,534
10	Publishing (printed matter)	NA	19,951	324	20,276	NA	$449,086	$21,897	$470,983
11	Business Services (copy shops)	NA	5,267	107	5,374	NA	$118,566	$7,215	$125,782
12	Auto Repair & Maintenance	NA	76,385	55	76,440	NA	$1,719,354	$3,704	$1,723,058
13	Military Bases	NA	225	88	314	NA	$5,075	$5,965	$11,040
	Subtotals =	NA	237,143	7,071	**244,214**	NA	$5,337,865	$477,465	**$5,815,330**
								Annualized cost =	$773,806
INDUSTRIAL WIPES HANDLERS:								AAE cost	
1	Industrial Wipes Manufacturers				0			$0	$0
2	Reusable Industrial Wipes Laundries				1,175			$3,519	$26,448
3	Solid Waste Management Units	Haz waste + MSW landfills + combustors only>			4,266			$12,777	$96,024
	Subtotals =				**5,441**				**$122,472**
								Annualized cost =	$16,296

COSTS ASSOCIATED WITH ANNUAL SURVEY BY INDUSTRIAL LAUNDRIES OF CUSTOMERS TO DETERMINE RCRA REGULATORY STATUS					
Item	Computation Element		Unit Cost*	Unit Cost Metric	Total
A. CUSTOMER SURVEY LETTER MAIL-OUT:					
1	Nr affected industrial laundry facilities sending out survey (in states adopting rule)				881
2	Nr customer survey letters required (reusable wipes facility count CESQGs+SQGs+LQGs)				107,025
3	Cost for survey mobilization	Managerial mobilization cost =	$275	Per laundry	$242,397
	(draft letter, access customer list)	Support staff mobilization cost =	$289	Per laundry	$254,510
4	Cost to reproduce survey letters		$0.15	Per letter	$16,054
5	Cost for survey envelopes & two-way postage		$0.76	Per envelope	$81,339
6	Cost to print/apply address labels for survey envelopes		$0.05	Per envelope	$5,351
				Subtotal (items 2+3+4) =	$102,744
B. PROCESS SURVEY INFORMATION:					
7	Cost to enter customer response info into ledger or database		$0.30	1 min./letter	$32,197
				Total cost (first-year) =	$734,592
				Annualized cost** =	$261,605
SUB-SECTOR BREAK-DOWN OF LAUNDRY CUSTOMER SURVEY COST					
Item	Sub-sector or Industry		Facility count	First-year cost	Annualized cost
REUSABLE INDUSTRIAL WIPES:					
1	Printing		31,177	$213,991	$76,207
2	Chemical & Allied Products		1,907	$13,088	$4,661
3	Plastics & Rubber		2,438	$16,734	$5,959
4	Fabricated Metal Products		8,552	$58,699	$20,904
5	Industrial Machinery & Eqpt		4,122	$28,292	$10,075
6	Electronics & Computers		956	$6,561	$2,336
7	Transportation Eqpt		1,955	$13,417	$4,778
8	Furniture & Fixtures		2,796	$19,192	$6,835
9	Auto Dealers (retail trade)		7,001	$48,056	$17,114
10	Publishing (printed matter)		17,695	$121,456	$43,253
11	Business services (copy shops)		4,803	$32,964	$11,739
12	Auto Repair & Maintenance		23,537	$161,550	$57,532
13	Military Bases		86	$591	$211
		Subtotals =	107,025	**$734,592**	**$261,605**
CUSTOMER RESPONSE TO SURVEY:					
		Average time for customers to respond to survey letter (minutes) =	10		
		Labor cost for customers to respond to survey letter ($/hour) =	$6		
		Total first-year cost =		**$613,297**	**$218,409**

Explanatory Notes:

(a) Managerial labor wage rate ($/hour) for item 3 = $34

(b) Clerical staff labor wage rate ($/hour) for item 3 = $18

(c) * Unit costs based on first approximation judgement by USEPA-OSW-EMRAD

(d) ** Customer re-survey frequency = 3

UNIT COSTS FOR SPENT WIPES CONTAINERS FOR ACCUMULATING & TRANSPORTING SOLVENT-CONTAMINATED INDUSTRIAL WIPES								
Item	Type of Equipment	Price unit	Year 2001 retail price	Year 2001 delivered cost*	Average lIfespan (years)	Year 2001 AAC**	Website Sources for Retail Prices	Website reference cost date
A. UNIT COSTS FOR CLOSABLE TRANSPORT CONTAINERS:								
OPTION: FLEXIBLE TRANSPORT CONTAINERS (plastic bags):								
Closeable containers:								
	Heavy-duty plastic flexible container (55 gallon 500 lbs):							
1	Outer shell	1 bag	$19.50	$22.32	1	$22.32	ENCO company quote to Jim O'Leary (USEPA-OSW-HWID)	March 2001
2	Inner liner	1 bag	$0.31	$0.35	0.2	$1.73	Associated Bag Company catalog (p.50)	May 2001
		Subtotal =	**$19.81**	**$22.68**		**$24.05**		
3	Heavy duty clear trash bags (34 gals, 75lbs, 30% post-cons)	1 bag	$0.19	$0.22	1	$0.22	http://www.2kstore.com/gragr/jwod/nsn2.htm	March 2001
Container labels								
4	Pre-printed vinyl adhesive labels (Note: Some bags may be pre-printed not requiring label)	1 label	$0.38	$0.43	1	$0.43	http://www.labsafety.com (non-regulated waste label 3BG-484V)	April 2003
OPTION: RIGID TRANSPORT CONTAINERS (metal drums):								
Closeable containers:* **								
1	55 gallon drum (corrosion resistant, leak-proof)	1 drum	$79	$90	5	$20.61	http://www.labsafety.com	Feb 2001
2	15 gallon drum (corrosion resistant, leak-proof)	1 drum	$48	$55	5	$12.53	http://www.labsafety.com	Feb 2001
Container labels								
3	Pre-printed vinyl adhesive labels	1 label	$1.26	$1.44	5	$0.33	http://www.labsafety.com/store/dept.asp?dept_id=6019	Feb 2001
B. UNIT COSTS FOR ON-SITE ACCUMULATION CONTAINER:								
Steel oily-waste covered containers for solvent wipes:								
1	21 gallon foot-lever cover drum (largest size)	1 drum	$105	$120	7	$20.85	http://www.labsafety.com	April 2003
2	10 gallon foot-lever cover drum (smallest size)	1 drum	$57	$65	7	$11.26	http://www.labsafety.com	April 2003

Explanatory Notes:

! * Delivered cost = [(Retail price) + (8% S&H cost) + (6% sales tax)] = Retail price multiplied by 1.145

! *** One alternative type of rigid container is a plastic drum ($40 to $50/drum); it is not listed above because its price falls between the other two types.

Accumulation & Transport Container Size & Solvent-Contaminated Industrial Wipes Average Containment Capacity Assumptions					
Container size (capacity):					
Gallons:	10	15	21	34	55
Cubic yards:	0.050	0.074	0.104	0.168	0.272
Maximum quantity spent solvent wipes per container:					
Reusables =	233	349	489	791	1,280
Disposables =	673	1,009	1,413	2,287	3,700
Weight of containers filled with spent solvent wipes (pounds):					
Reusables =	29	44	61	99	160
Disposables =	36	55	76	124	200

Assumptions for Average Unit Weight (Per Wipe) of Solvent-Contaminated Industrial Wipes			
Type of Industrial Wipe	Weight Equivalencies		
	pounds per wipe	ounces per wipe	grams per wipe
Reusable wipes	0.125	2.0	57.1
Disposable wipes	0.054	0.9	24.7

COST OF CLOSEABLE WIPES ACCUMULATION CONTAINERS

Item	Sub-sector	A. Annual Solvent Industrial Wipes Used: SQGs	LQGs	Subtotals	B. Factors: B. % must have cont-ainers	C. % wipes w/out cont-ainers	C. Annual Add'tl Containers Filled: 10 / 505 SQGs	21 / 1060 LQGs	<Gal/contr <Average spent wipes per container Subtotals	D. Weekly Contrs Filled: Operating weeks per year > 50 SQGs	LQGs	Subtotals	E. Containers Needed (first year): Transport cycle mutiplier > 2 SQGs	LQGs	Subtotals	F. First-Year Cost for Containers: $57 SQGs	$105 LQGs	<$/contnr Subtotals	G. Annualized Avg Cost $11.26 SQGs	$20.85 LQGs	<$/contnr Subtotals
DISPOSABLE INDUSTRIAL WIPES:																					
1	Printing	17,050,706	2,237,036	19,287,742	100%	50%	3,072	403	3,475	61	8	70	28,590	399	28,989	$1,621,035	$41,917	$1,662,952	$321,815	$8,322	$330,137
2	Chemical & Allied Products	3,688,283	1,534,228	5,222,511	100%	50%	665	276	941	13	6	19	1,524	212	1,735	$86,399	$22,229	$108,628	$17,152	$4,413	$21,565
3	Plastics & Rubber	5,046,501	1,223,989	6,270,490	100%	50%	909	221	1,130	18	4	23	2,050	166	2,216	$116,254	$17,447	$133,701	$23,079	$3,464	$26,543
4	Fabricated Metal Products	17,617,131	2,365,937	19,983,068	100%	50%	3,174	426	3,601	63	9	72	7,435	334	7,769	$421,582	$35,025	$456,607	$83,694	$6,953	$90,648
5	Industrial Machinery & Eqpt	11,175,962	666,528	11,842,489	100%	50%	2,014	120	2,134	40	2	43	3,669	73	3,742	$208,060	$7,643	$215,703	$41,305	$1,517	$42,822
6	Electronics & Computers	4,057,776	2,944,176	7,001,952	100%	50%	731	530	1,262	15	11	25	702	170	872	$39,802	$17,800	$57,602	$7,902	$3,534	$11,435
7	Transportation Eqpt	3,437,833	1,691,823	5,129,656	100%	50%	619	305	924	12	6	18	1,529	251	1,780	$86,685	$26,362	$113,047	$17,209	$5,233	$22,443
8	Furniture & Fixtures	5,967,077	391,685	6,358,762	100%	50%	1,075	71	1,146	22	1	23	2,484	54	2,539	$140,871	$5,700	$146,571	$27,966	$1,132	$29,098
9	Auto Dealers (retail trade)	13,673,062	2,492,579	16,165,642	100%	50%	2,464	449	2,913	49	9	58	5,998	365	6,362	$340,059	$38,315	$378,375	$67,510	$7,607	$75,117
10	Publishing (printed matter)	8,648,444	1,327,236	9,975,680	100%	50%	1,558	239	1,797	31	5	36	16,190	263	16,453	$917,988	$27,630	$945,618	$182,243	$5,485	$187,728
11	Business services (copy shops)	2,245,659	432,263	2,677,922	100%	50%	405	78	483	8	2	10	4,377	89	4,466	$248,165	$9,322	$257,488	$49,267	$1,851	$51,118
12	Auto Repair & Maintenance	46,973,682	102,352	47,076,034	100%	50%	8,464	18	8,482	169	0	170	21,344	16	21,360	$1,210,193	$1,649	$1,211,842	$240,253	$327	$240,581
13	Military Bases	154,957	188,643	343,601	100%	50%	28	34	62	1	1	1	56	23	79	$3,185	$2,368	$5,553	$632	$470	$1,102
	Subtotal Printers	27,944,809	3,996,535	31,941,344			5,035	720	5,755												
	Subtotal Non-Printers	111,792,264	13,601,941	125,394,205			20,143	2,451	22,594												
	Totals =	139,737,074	17,598,476	157,335,550			25,178	3,171	28,349	504	63	567	1,007	127	1,134	$5,440,279	$253,408	$5,693,687	1,080,029	$50,308	$1,130,337
REUSABLE WIPES:																					
							175 / 505 SQGs	367 / 1060 LQGs	<Average spent wipes per container Subtotals												
1	Printing	565,659,591	74,303,831	639,963,423	100%	50%	1,620,379	101,357	1,721,736	32,408	2,027	34,435	32,408	2,027	34,435	$1,837,510	$212,850	$2,050,359	$364,791	$42,256	$407,047
2	Chemical & Allied Products	42,186,313	23,718,009	65,904,321	100%	50%	120,846	32,353	153,200	2,417	647	3,064	2,417	647	3,064	$137,040	$67,942	$204,982	$27,206	$13,488	$40,694
3	Plastics & Rubber	57,707,802	18,928,159	76,635,961	100%	50%	165,309	25,820	191,128	3,306	516	3,823	3,306	516	3,823	$187,460	$54,221	$241,681	$37,215	$10,764	$47,980
4	Fabricated Metal Products	201,522,873	36,600,626	238,123,499	100%	50%	577,279	49,926	627,206	11,546	999	12,544	11,546	999	12,544	$654,634	$104,846	$759,480	$129,961	$20,814	$150,775
5	Industrial Machinery & Eqpt	127,845,668	10,260,172	138,105,840	100%	50%	366,225	13,996	380,220	7,324	280	7,604	7,324	280	7,604	$415,299	$29,391	$444,690	$82,447	$5,835	$88,282
6	Electronics & Computers	46,459,279	45,438,499	91,897,779	100%	50%	133,086	61,982	195,069	2,662	1,240	3,901	2,662	1,240	3,901	$150,920	$130,162	$281,082	$29,961	$25,840	$55,802
7	Transportation Eqpt	39,297,004	26,121,783	65,418,787	100%	50%	112,570	35,632	148,202	2,251	713	2,964	2,251	713	2,964	$127,654	$74,828	$202,482	$25,342	$14,855	$40,198
8	Furniture & Fixtures	68,269,281	6,043,292	74,312,573	100%	50%	195,563	8,244	203,807	3,911	165	4,076	3,911	165	4,076	$221,768	$17,312	$239,080	$44,027	$3,437	$47,463
9	Auto Dealers (retail trade)	156,360,483	38,513,024	194,873,507	100%	50%	447,908	52,535	500,443	8,958	1,051	10,009	8,958	1,051	10,009	$507,927	$110,324	$618,251	$100,836	$21,902	$122,738
10	Publishing (printed matter)	286,768,691	43,841,615	330,610,306	100%	50%	821,473	59,804	881,277	16,429	1,196	17,626	16,429	1,196	17,626	$931,550	$125,588	$1,057,138	$184,936	$24,932	$209,868
11	Business services (copy shops)	74,581,196	14,233,053	88,814,248	100%	50%	213,644	19,415	233,059	4,273	388	4,661	4,273	388	4,661	$242,272	$40,772	$283,044	$48,097	$8,094	$56,191
12	Auto Repair & Maintenance	537,276,832	1,600,626	538,877,458	100%	50%	1,539,074	2,183	1,541,258	30,781	44	30,825	30,781	44	30,825	$1,745,310	$4,585	$1,749,895	$346,487	$910	$347,397
13	Military Bases	1,778,937	2,887,726	4,666,663	100%	50%	5,096	3,939	9,035	102	79	181	102	79	181	$5,779	$8,272	$14,051	$1,147	$1,642	$2,789
	Subtotal Printers	927,009,478	132,378,499	1,059,387,977			2,655,496	180,576	2,836,072												
	Subtotal Non-Printers	1,278,704,471	210,111,917	1,488,816,388			3,662,956	286,611	3,949,567												
	Totals =	2,205,713,949	342,490,416	2,548,204,365			6,318,451	467,187	6,785,638	126,369	9,344	135,713	252,738	18,687	271,426	$7,165,124	$981,092	$8,146,216	1,422,453	**$194,771**	$1,617,224

TRANSPORT CONTAINTER OPTION 1:
COST OF PLASTIC BAG TRANSPORT CONTAINERS

							SQGs	LQGs		SQGs	LQGs				
						Size of container (gallons) =	34	34	Replace/yr>	1	1				
						Average reusables loading for transport as % of container capacity =	70%	70%							
						Average disposables loading for transport as % of container capacity =	50%	50%							
						Average quantity solvent-contaminated reusable wipes loaded into container =	554	554	69	<Pounds per filled reusables bag					
						Average quantity solvent-contaminated disposable wipes loaded into container =	1,144	1,144	62	<Pounds per filled disposables bag					
		A. Annual Solvent Industrial Wipes Used:			B. % must have cont-	C. % wipes w/out containers	D. Annual Additional Containers Filled:			Operating weeks/year =	50	Transport cycle mutiplier =	1		
										E. Weekly Containers Filled:			F. Containers Needed (first year):		
Item	Sub-sector	SQGs	LQGs	Subtotals	ainers		SQGs	LQGs	Subtotals	SQGs	LQGs	Subtotals	SQGs	LQGs	Subtotals
A. REUSABLE INDUSTRIAL WIPES:															
1	Printing	565,659,591	74,303,831	639,963,423	100%	50%	510,624	67,074	577,698	10,212	1,341	11,554	510,624	67,074	577,698
2	Chemical & Allied Products	42,186,313	23,718,009	65,904,321	100%	50%	38,082	21,410	59,492	762	428	1,190	38,082	21,410	59,492
3	Plastics & Rubber	57,707,802	18,928,159	76,635,961	100%	50%	52,093	17,087	69,180	1,042	342	1,384	52,093	17,087	69,180
4	Fabricated Metal Products	201,522,873	36,600,626	238,123,499	100%	50%	181,916	33,040	214,955	3,638	661	4,299	181,916	33,040	214,955
5	Industrial Machinery & Eqpt	127,845,668	10,260,172	138,105,840	100%	50%	115,407	9,262	124,669	2,308	185	2,493	115,407	9,262	124,669
6	Electronics & Computers	46,459,279	45,438,499	91,897,779	100%	50%	41,939	41,018	82,957	839	820	1,659	41,939	41,018	82,957
7	Transportation Eqpt	39,297,004	26,121,783	65,418,787	100%	50%	35,474	23,580	59,054	709	472	1,181	35,474	23,580	59,054
8	Furniture & Fixtures	68,269,281	6,043,292	74,312,573	100%	50%	61,627	5,455	67,082	1,233	109	1,342	61,627	5,455	67,082
9	Auto Dealers (retail trade)	156,360,483	38,513,024	194,873,507	100%	50%	141,147	34,766	175,913	2,823	695	3,518	141,147	34,766	175,913
10	Publishing (printed matter)	286,768,691	43,841,615	330,610,306	100%	50%	258,867	39,576	298,444	5,177	792	5,969	258,867	39,576	298,444
11	Business services (copy shops)	74,581,196	14,233,053	88,814,248	100%	50%	67,325	12,848	80,173	1,346	257	1,603	67,325	12,848	80,173
12	Auto Repair & Maintenance	537,276,832	1,600,626	538,877,458	100%	50%	485,002	1,445	486,447	9,700	29	9,729	485,002	1,445	486,447
13	Military Bases	1,778,937	2,887,726	4,666,663	100%	50%	1,606	2,607	4,213	32	52	84	1,606	2,607	4,213
	National Totals =	2,205,713,949	342,490,416	2,548,204,365			1,991,109	309,168	2,300,276	39,822	6,183	46,006	1,991,109	309,168	**2,300,276**
			Avg per facility =	26,830				Cubic yards equivalent =	387,225		Avg per facility =	0.484		Avg per facility =	24.220
								Tons equivalent =	113,759						
								Printer containers filled =	956,315	42%					
								Non-printer containers filled =	1,343,962	58%					
B. DISPOSABLE INDUSTRIAL WIPES (for transport of eligible wipes to non-haz waste landfills under the exemption):															
1	Printing	0	0	0	100%	50%	0	0	0	0	0	0	0	0	0
2	Chemical & Allied Products	2,982,060	1,240,458	4,222,517	100%	50%	2,608	1,085	3,692	52	22	74	2,608	1,085	3,692
3	Plastics & Rubber	4,080,210	989,623	5,069,832	100%	50%	3,568	865	4,433	71	17	89	3,568	865	4,433
4	Fabricated Metal Products	14,243,846	1,912,913	16,156,759	100%	50%	12,455	1,673	14,128	249	33	283	12,455	1,673	14,128
5	Industrial Machinery & Eqpt	9,036,016	538,902	9,574,919	100%	50%	7,901	471	8,372	158	9	167	7,901	471	8,372
6	Electronics & Computers	3,280,803	2,380,433	5,661,236	100%	50%	2,869	2,081	4,950	57	42	99	2,869	2,081	4,950
7	Transportation Eqpt	2,779,565	1,367,877	4,147,442	100%	50%	2,430	1,196	3,627	49	24	73	2,430	1,196	3,627
8	Furniture & Fixtures	4,824,516	316,686	5,141,202	100%	50%	4,219	277	4,495	84	6	90	4,219	277	4,495
9	Auto Dealers (retail trade)	11,054,978	2,015,306	13,070,284	100%	50%	9,667	1,762	11,429	193	35	229	9,667	1,762	11,429
10	Publishing (printed matter)	0	0	0	100%	50%	0	0	0	0	0	0	0	0	0
11	Business services (copy shops)	0	0	0	100%	50%	0	0	0	0	0	0	0	0	0
12	Auto Repair & Maintenance	37,979,277	82,754	38,062,031	100%	50%	33,209	72	33,282	664	1	666	33,209	72	33,282
13	Military Bases	125,286	152,522	277,809	100%	50%	110	133	243	2	3	5	110	133	243
	National Totals =	90,386,558	10,997,475	101,384,033			79,034	9,616	88,651	1,581	192	1,773	79,034	9,616	**88,651**
			Avg per facility =	12,158				Cubic yards equivalent =	14,923		Avg per facility =	0.213		Avg per facility =	10.631
								Tons equivalent =	5,480						

TRANSPORT CONTAINER OPTION 1 (CONTINUED):
COST OF PLASTIC BAG TRANSPORT CONTAINERS

		FIRST-YEAR COSTS:						ANNUALIZED COSTS:								
		CONTAINERS (first year):			LABELS (first year):			CONTAINERS (annualized):			LABELS (annualized):			TOTAL annualized:		
		34	34	<Size (gals)	$0.43	$0.43	<Unit cost	34	34	<Size (gals)	$0.43	$0.43	<Unit cost			
		$0.22	$0.22	<Unit cost	1	1	<Labels/cntnr	$0.22	$0.22	<Unit cost	1	1	<Labels/cntnr			
Item	Sub-Sector	SQGs	LQGs	Subtotals	SQGs	LQGs	Subtotals	SQGs	LQGs	Subtotals	SQGs	LQGs	Subtotals	SQGs	LQGs	Subtotals
REUSABLE WIPES																
1	Printing	$110,739	$14,546	$125,286	$0	$0	$0	$110,739	$14,546	$125,286	$0	$0	$0	$110,739	$14,546	$125,286
2	Chemical & Allied Products	$8,259	$4,643	$12,902	$0	$0	$0	$8,259	$4,643	$12,902	$0	$0	$0	$8,259	$4,643	$12,902
3	Plastics & Rubber	$11,297	$3,706	$15,003	$0	$0	$0	$11,297	$3,706	$15,003	$0	$0	$0	$11,297	$3,706	$15,003
4	Fabricated Metal Products	$39,452	$7,165	$46,618	$0	$0	$0	$39,452	$7,165	$46,618	$0	$0	$0	$39,452	$7,165	$46,618
5	Industrial Machinery & Eqpt	$25,028	$2,009	$27,037	$0	$0	$0	$25,028	$2,009	$27,037	$0	$0	$0	$25,028	$2,009	$27,037
6	Electronics & Computers	$9,095	$8,896	$17,991	$0	$0	$0	$9,095	$8,896	$17,991	$0	$0	$0	$9,095	$8,896	$17,991
7	Transportation Eqpt	$7,693	$5,114	$12,807	$0	$0	$0	$7,693	$5,114	$12,807	$0	$0	$0	$7,693	$5,114	$12,807
8	Furniture & Fixtures	$13,365	$1,183	$14,548	$0	$0	$0	$13,365	$1,183	$14,548	$0	$0	$0	$13,365	$1,183	$14,548
9	Auto Dealers (retail trade)	$30,611	$7,540	$38,150	$0	$0	$0	$30,611	$7,540	$38,150	$0	$0	$0	$30,611	$7,540	$38,150
10	Publishing (printed matter)	$56,141	$8,583	$64,724	$0	$0	$0	$56,141	$8,583	$64,724	$0	$0	$0	$56,141	$8,583	$64,724
11	Business Services (copy shops)	$14,601	$2,786	$17,387	$0	$0	$0	$14,601	$2,786	$17,387	$0	$0	$0	$14,601	$2,786	$17,387
12	Auto Repair & Maintenance	$105,183	$313	$105,496	$0	$0	$0	$105,183	$313	$105,496	$0	$0	$0	$105,183	$313	$105,496
13	Military Bases	$348	$565	$914	$0	$0	$0	$348	$565	$914	$0	$0	$0	$348	$565	$914
	Reusables totals =	$431,814	$67,049	**$498,863**	$0	$0	**$0**	$431,814	$67,049	**$498,863**	$0	$0	**$0**	$431,814	$67,049	**$498,863**
			Avg per facility =	$5.25		Avg per facility =	$0.00		Avg per facility =	$5.25		Avg per facility =	$0.00	$4.55	$0.71	$5.25
DISPOSABLE WIPES																
1	Printing	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2	Chemical & Allied Products	$565	$235	$801	$1,119	$466	$1,585	$565	$235	$801	$1,119	$466	$1,585	$1,685	$701	$2,386
3	Plastics & Rubber	$774	$188	$961	$1,532	$371	$1,903	$774	$188	$961	$1,532	$371	$1,903	$2,305	$559	$2,865
4	Fabricated Metal Products	$2,701	$363	$3,064	$5,347	$718	$6,065	$2,701	$363	$3,064	$5,347	$718	$6,065	$8,048	$1,081	$9,129
5	Industrial Machinery & Eqpt	$1,714	$102	$1,816	$3,392	$202	$3,594	$1,714	$102	$1,816	$3,392	$202	$3,594	$5,105	$304	$5,410
6	Electronics & Computers	$622	$451	$1,074	$1,232	$894	$2,125	$622	$451	$1,074	$1,232	$894	$2,125	$1,854	$1,345	$3,199
7	Transportation Eqpt	$527	$259	$786	$1,043	$513	$1,557	$527	$259	$786	$1,043	$513	$1,557	$1,570	$773	$2,343
8	Furniture & Fixtures	$915	$60	$975	$1,811	$119	$1,930	$915	$60	$975	$1,811	$119	$1,930	$2,726	$179	$2,905
9	Auto Dealers (retail trade)	$2,096	$382	$2,479	$4,150	$757	$4,906	$2,096	$382	$2,479	$4,150	$757	$4,906	$6,246	$1,139	$7,385
10	Publishing (printed matter)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
11	Business Services (copy shops)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
12	Auto Repair & Maintenance	$7,202	$16	$7,218	$14,257	$31	$14,288	$7,202	$16	$7,218	$14,257	$31	$14,288	$21,459	$47	$21,506
13	Military Bases	$24	$29	$53	$47	$57	$104	$24	$29	$53	$47	$57	$104	$71	$86	$157
	Disposables subtotals =	$17,140	$2,085	**$19,226**	$33,929	$4,128	**$38,058**	$17,140	$2,085	**$19,226**	$33,929	$4,128	**$38,058**	$51,070	$6,214	**$57,283**
			Avg per facility =	$2.31		Avg per facility =	$4.56		Avg per facility =	$2.31		Avg per facility =	$4.56	$4.55	$0.71	$6.87

TRANSPORT CONTAINER OPTION 2:
COST OF METAL DRUM TRANSPORT CONTAINERS

							SQGs	LQGs	SQGs	LQGs	
						Size of container (gallons) =	55	55	55	55	
						Average loading for transport as % of container capacity =	75%	75%			
						Average quantity solvent-contaminated reusable wipes loaded into container =	960	960	120	120	<Pounds per reusable filled rigid container
						Average quantity solvent-contaminated disposable wipes loaded into container =	2,775	2,775	150	150	<Pounds per disposable filled rigid container
										Operating weeks/year =	50	Transport cycle mutiplier =	2
		A. Annual Solvent Industrial Wipes Used:			B. % must have cont-ainers	C. % wipes w/out cont-ainers	D. Annual Additional Containers Filled:			E. Weekly Containers Filled:			F. Containers Needed (first year):		
Item	Sub-sector	SQGs	LQGs	Subtotals			SQGs	LQGs	Subtotals	SQGs	LQGs	Subtotals	SQGs	LQGs	Subtotals
A. REUSABLE INDUSTRIAL WIPES:															
1	Printing	565,659,591	74,303,831	639,963,423	100%	50%	294,614	38,700	333,314	5,892	774	6,666	11,785	1,548	13,333
2	Chemical & Allied Products	42,186,313	23,718,009	65,904,321	100%	50%	21,972	12,353	34,325	439	247	687	879	494	1,373
3	Plastics & Rubber	57,707,802	18,928,159	76,635,961	100%	50%	30,056	9,858	39,915	601	197	798	1,202	394	1,597
4	Fabricated Metal Products	201,522,873	36,600,626	238,123,499	100%	50%	104,960	19,063	124,023	2,099	381	2,480	4,198	763	4,961
5	Industrial Machinery & Eqpt	127,845,668	10,260,172	138,105,840	100%	50%	66,586	5,344	71,930	1,332	107	1,439	2,663	214	2,877
6	Electronics & Computers	46,459,279	45,438,499	91,897,779	100%	50%	24,198	23,666	47,863	484	473	957	968	947	1,915
7	Transportation Eqpt	39,297,004	26,121,783	65,418,787	100%	50%	20,467	13,605	34,072	409	272	681	819	544	1,363
8	Furniture & Fixtures	68,269,281	6,043,292	74,312,573	100%	50%	35,557	3,148	38,704	711	63	774	1,422	126	1,548
9	Auto Dealers (retail trade)	156,360,483	38,513,024	194,873,507	100%	50%	81,438	20,059	101,497	1,629	401	2,030	3,258	802	4,060
10	Publishing (printed matter)	286,768,691	43,841,615	330,610,306	100%	50%	149,359	22,834	172,193	2,987	457	3,444	5,974	913	6,888
11	Business services (copy shops)	74,581,196	14,233,053	88,814,248	100%	50%	38,844	7,413	46,257	777	148	925	1,554	297	1,850
12	Auto Repair & Maintenance	537,276,832	1,600,626	538,877,458	100%	50%	279,832	834	280,665	5,597	17	5,613	11,193	33	11,227
13	Military Bases	1,778,937	2,887,726	4,666,663	100%	50%	927	1,504	2,431	19	30	49	37	60	97
	Reusable Sub-Totals =	2,205,713,949	342,490,416	2,548,204,365			1,148,809	178,380	1,327,190	22,976	3,568	26,544	45,952	7,135	**53,088**
			Avg per facility =	26,830				Avg per facility =	14.0		Avg per facility =	0.279		Avg per facility =	0.559
						Cubic yards equivalent =	85,319	48,575	133,894						
						Tons equivalent =	25,065	14,270	39,335						
B. DISPOSABLE INDUSTRIAL WIPES (for transport of non-eligible wipes to non-landfill disposal under the exemption):															
1	Printing	17,050,706	2,237,036	19,287,742	100%	50%	3,072	403	3,475	61	8	70	6,144	806	6,951
2	Chemical & Allied Products	3,688,283	1,534,228	5,222,511	100%	50%	665	276	941	13	6	19	1,329	553	1,882
3	Plastics & Rubber	5,046,501	1,223,989	6,270,490	100%	50%	909	221	1,130	18	4	23	1,819	441	2,260
4	Fabricated Metal Products	17,617,131	2,365,937	19,983,068	100%	50%	3,174	426	3,601	63	9	72	6,349	853	7,201
5	Industrial Machinery & Eqpt	11,175,962	666,528	11,842,489	100%	50%	2,014	120	2,134	40	2	43	4,027	240	4,268
6	Electronics & Computers	4,057,776	2,944,176	7,001,952	100%	50%	731	530	1,262	15	11	25	1,462	1,061	2,523
7	Transportation Eqpt	3,437,833	1,691,823	5,129,656	100%	50%	619	305	924	12	6	18	1,239	610	1,849
8	Furniture & Fixtures	5,967,077	391,685	6,358,762	100%	50%	1,075	71	1,146	22	1	23	2,150	141	2,291
9	Auto Dealers (retail trade)	13,673,062	2,492,579	16,165,642	100%	50%	2,464	449	2,913	49	9	58	4,927	898	5,825
10	Publishing (printed matter)	8,648,444	1,327,236	9,975,680	100%	50%	1,558	239	1,797	31	5	36	3,117	478	3,595
11	Business services (copy shops)	2,245,659	432,263	2,677,922	100%	50%	405	78	483	8	2	10	809	156	965
12	Auto Repair & Maintenance	46,973,682	102,352	47,076,034	100%	50%	8,464	18	8,482	169	0	170	16,927	37	16,964
13	Military Bases	154,957	188,643	343,601	100%	50%	28	34	62	1	1	1	56	68	124
	Disposable Sub-Totals =	139,737,074	17,598,476	157,335,550			25,178	3,171	28,349	504	63	567	50,356	6,342	**56,697**
			Avg per facility =	18,867				Avg per facility =	3.4		Avg per facility =	0.068		Avg per facility =	6.799
						Cubic yards equivalent =	1,870	863	2,733						
						Tons equivalent =	687	317	1,004						

TRANSPORT CONTAINER OPTION 2 (CONTINUED): COST OF METAL DRUM TRANSPORT CONTAINERS

		FIRST-YEAR COST:						ANNUALIZED COSTS:								
								CONTAINERS (annualized):			LABELS (annualized):			TOTAL ANNUALIZED:		
		CONTAINERS (first year):			LABELS (first year):											
		55	55	<Size (gals)	$1.44	$1.44	<Unit cost	55	55	<Size (gals)	$0.33	$0.33	<Unit cost			
		$90	$90	<Unit cost	3	3	<Labels/cntnr	$21	$21	<Unit cost	3	3	<Labels/cntr			
Item	Sub-Sectors	SQGs	LQGs	Subtotals	SQGs	LQGs	Subtotals	SQGs	LQGs	Subtotals	SQGs	LQGs	Subtotals	SQGs	LQGs	Subtotals
REUSABLE WIPES:																
1	Printing	$1,065,788	$140,000	$1,205,787	$0	$0	$0	$242,931	$31,911	$274,841	$0	$0	$0	$242,931	$31,911	$274,841
2	Chemical & Allied Products	$79,485	$44,688	$124,174	$0	$0	$0	$18,118	$10,186	$28,304	$0	$0	$0	$18,118	$10,186	$28,304
3	Plastics & Rubber	$108,730	$35,663	$144,394	$0	$0	$0	$24,783	$8,129	$32,912	$0	$0	$0	$24,783	$8,129	$32,912
4	Fabricated Metal Products	$379,699	$68,961	$448,660	$0	$0	$0	$86,547	$15,719	$102,266	$0	$0	$0	$86,547	$15,719	$102,266
5	Industrial Machinery & Eqpt	$240,880	$19,332	$260,212	$0	$0	$0	$54,905	$4,406	$59,312	$0	$0	$0	$54,905	$4,406	$59,312
6	Electronics & Computers	$87,536	$85,613	$173,149	$0	$0	$0	$19,953	$19,514	$39,467	$0	$0	$0	$19,953	$19,514	$39,467
7	Transportation Eqpt	$74,041	$49,217	$123,259	$0	$0	$0	$16,877	$11,218	$28,095	$0	$0	$0	$16,877	$11,218	$28,095
8	Furniture & Fixtures	$128,630	$11,386	$140,016	$0	$0	$0	$29,319	$2,595	$31,915	$0	$0	$0	$29,319	$2,595	$31,915
9	Auto Dealers (retail trade)	$294,607	$72,564	$367,171	$0	$0	$0	$67,151	$16,540	$83,691	$0	$0	$0	$67,151	$16,540	$83,691
10	Publishing (printed matter)	$540,315	$82,604	$622,919	$0	$0	$0	$123,157	$18,828	$141,985	$0	$0	$0	$123,157	$18,828	$141,985
11	Business Services (copy shops)	$140,522	$26,817	$167,339	$0	$0	$0	$32,030	$6,113	$38,143	$0	$0	$0	$32,030	$6,113	$38,143
12	Auto Repair & Maintenance	$1,012,310	$3,016	$1,015,326	$0	$0	$0	$230,741	$687	$231,429	$0	$0	$0	$230,741	$687	$231,429
13	Military Bases	$3,352	$5,441	$8,793	$0	$0	$0	$764	$1,240	$2,004	$0	$0	$0	$764	$1,240	$2,004
	Reusable Sub-totals =	$4,155,896	$645,303	**$4,801,199**	$0	$0	**$0**	$947,275	$147,087	**$1,094,362**	$0	$0	**$0**	$947,275	$147,087	**$1,094,362**
			Avg per facility =	$50.55		Avg per facility =	$0.00		Avg per facility =	$11.52		Avg per facility =	$0.00		Avg per facility =	$11.52
DISPOSABLE WIPES:																
1	Printing	$555,695	$72,907	$628,601	$26,589	$3,488	$30,077	$126,662	$16,618	$143,280	$6,061	$795	$6,856	$132,723	$17,413	$150,136
2	Chemical & Allied Products	$120,204	$50,002	$170,205	$5,752	$2,392	$8,144	$27,399	$11,397	$38,796	$1,311	$545	$1,856	$28,710	$11,942	$40,652
3	Plastics & Rubber	$164,469	$39,891	$204,360	$7,870	$1,909	$9,778	$37,488	$9,092	$46,581	$1,794	$435	$2,229	$39,282	$9,528	$48,810
4	Fabricated Metal Products	$574,155	$77,108	$651,262	$27,472	$3,689	$31,162	$130,870	$17,576	$148,446	$6,262	$841	$7,103	$137,132	$18,416	$155,548
5	Industrial Machinery Eqpt	$364,232	$21,723	$385,955	$17,428	$1,039	$18,467	$83,021	$4,951	$87,973	$3,972	$237	$4,209	$86,994	$5,188	$92,182
6	Electronic & Computers	$132,246	$95,953	$228,199	$6,328	$4,591	$10,919	$30,143	$21,871	$52,014	$1,442	$1,046	$2,489	$31,586	$22,918	$54,503
7	Transportation Eqpt	$112,041	$55,138	$167,179	$5,361	$2,638	$7,999	$25,538	$12,568	$38,106	$1,222	$601	$1,823	$26,760	$13,169	$39,929
8	Furniture & Fixtures	$194,471	$12,765	$207,237	$9,305	$611	$9,916	$44,327	$2,910	$47,237	$2,121	$139	$2,260	$46,448	$3,049	$49,497
9	Auto Dealers (retail trade)	$445,615	$81,235	$526,850	$21,322	$3,887	$25,209	$101,571	$18,516	$120,088	$4,860	$886	$5,746	$106,431	$19,402	$125,834
10	Publishing (printed matter)	$281,859	$43,256	$325,114	$13,486	$2,070	$15,556	$64,246	$9,859	$74,105	$3,074	$472	$3,546	$67,320	$10,331	$77,651
11	Business Services (copy shops)	$73,188	$14,088	$87,275	$3,502	$674	$4,176	$16,682	$3,211	$19,893	$798	$154	$952	$17,480	$3,365	$20,845
12	Auto Repair & Maintenance	$1,530,905	$3,336	$1,534,241	$73,251	$160	$73,411	$348,947	$760	$349,708	$16,696	$36	$16,733	$365,644	$797	$366,440
13	Military Bases	$5,050	$6,148	$11,198	$242	$294	$536	$1,151	$1,401	$2,552	$55	$67	$122	$1,206	$1,468	$2,675
	Disposable Sub-totals =	$4,554,129	$573,547	**$5,127,676**	$217,906	$27,443	**$245,350**	$1,038,047	$130,731	**$1,168,778**	$49,669	$6,255	**$55,924**	$1,087,715	$136,987	**$1,224,702**
			Avg per facility =	$614.90		Avg per facility =	$29.42		Avg per facility =	$140.16		Avg per facility =	$6.71		Avg per facility =	$146.86

Labor Cost to Affix Labels to Transport Containers for Spent Disposable Industrial Wipes								
		A. First-Year Cost:			B. Annualized Cost:			
	Labor minutes/container to affix labels>	1	1	Subtotals	1	1	Subtotals	
	Average hourly labor wage ($/hour)>	$15.47	$15.47		$15.47	$15.47		
		SQGs	LQGs		SQGs	LQGs		
A. If Plastic Bag Transport Containers								
	Number of labels per container>	1	1		1	1		
1	Printing	$0	$0	$0	$0	$0	$0	
2	Chemical & Allied Products	$672	$280	$952	$672	$280	$952	
3	Plastics & Rubber	$920	$223	$1,143	$920	$223	$1,143	
4	Fabricated Metal Products	$3,211	$431	$3,642	$3,211	$431	$3,642	
5	Industrial Machinery & Eqpt	$2,037	$121	$2,158	$2,037	$121	$2,158	
6	Electronics & Computers	$740	$537	$1,276	$740	$537	$1,276	
7	Transportation Eqpt	$627	$308	$935	$627	$308	$935	
8	Furniture & Fixtures	$1,088	$71	$1,159	$1,088	$71	$1,159	
9	Auto Dealers (retail trade)	$2,492	$454	$2,946	$2,492	$454	$2,946	
10	Publishing (printed matter)	$0	$0	$0	$0	$0	$0	
11	Business services (copy shops)	$0	$0	$0	$0	$0	$0	
12	Auto Repair & Maintenance	$8,562	$19	$8,580	$8,562	$19	$8,580	
13	Military Bases	$28	$34	$63	$28	$34	$63	
	National Totals =	$20,376	$2,479	**$22,855**	$20,376	$2,479	**$22,855**	
B. If Metal Drum Transport Containers								
	Number of labels per container>	3	3		3	3		
1	Printing	$4,752	$623	$5,376	$1,083	$142	$1,225	
2	Chemical & Allied Products	$1,028	$428	$1,456	$234	$97	$332	
3	Plastics & Rubber	$1,407	$341	$1,748	$321	$78	$398	
4	Fabricated Metal Products	$4,910	$659	$5,570	$1,119	$150	$1,269	
5	Industrial Machinery & Eqpt	$3,115	$186	$3,301	$710	$42	$752	
6	Electronics & Computers	$1,131	$821	$1,952	$258	$187	$445	
7	Transportation Eqpt	$958	$472	$1,430	$218	$107	$326	
8	Furniture & Fixtures	$1,663	$109	$1,772	$379	$25	$404	
9	Auto Dealers (retail trade)	$3,811	$695	$4,506	$869	$158	$1,027	
10	Publishing (printed matter)	$2,410	$370	$2,780	$549	$84	$634	
11	Business services (copy shops)	$626	$120	$746	$143	$27	$170	
12	Auto Repair & Maintenance	$13,092	$29	$13,121	$2,984	$7	$2,991	
13	Military Bases	$43	$53	$96	$10	$12	$22	
	National Totals =	$38,947	$4,905	**$43,852**	$8,877	$1,118	**$9,995**	

AVOIDED RCRA MANIFEST COST
FOR SOLVENT-CONTAMINATED DISPOSABLE WIPES
(Estimate Based on RCRA Haz Waste Storage Limit w/o Permit (40 CFR 262.30)):

DISPOSABLE INDUSTRIAL WIPES:

Item	Sub-sector	A. Annual spent wipes containers generated:			B. Nr. containers per month per facility:		C. Nr. containers per RCRA limit/facility:		D. Nr. truckloads per RCRA period:		E. Nr. annual truckloads (shipments):			F. Avoided RCRA manifest cost:		
		34	34	<Avg contr gals	RCRA storage limit	months>	6	3	40	40	<average containers per truck			$192	$199	<avg cost per manifest
		SQGs	LQGs	Totals	SQGs	LQGs	SQGs	LQGs	SQGs	LQGs	SQGs	LQGs	Total	SQGs	LQGs	Totals
1	Printing	14,909	1,956	16,865	0.6	5.4	3.5	16.2	1	1	4,316	121	4,436	$828,650	$23,985	$852,635
2	Chemical & Allied Products	5,833	2,426	8,259	3.1	12.7	18.8	38.0	1	1	311	64	375	$59,655	$12,720	$72,375
3	Plastics & Rubber	7,980	1,936	9,916	3.2	12.9	19.1	38.6	1	1	418	50	468	$80,269	$9,983	$90,252
4	Fabricated Metal Products	27,859	3,741	31,601	3.1	12.4	18.4	37.2	1	1	1,516	101	1,617	$291,086	$20,042	$311,128
5	Industrial Machinery & Eqpt	17,673	1,054	18,727	3.9	16.0	23.6	48.0	1	2	748	44	792	$143,657	$8,747	$152,404
6	Electronics & Computers	6,417	4,656	11,073	7.5	30.3	44.8	91.0	2	3	286	154	440	$54,964	$30,556	$85,520
7	Transportation Eqpt	5,437	2,675	8,112	2.9	11.8	17.4	35.3	1	1	312	76	388	$59,853	$15,084	$74,937
8	Furniture & Fixtures	9,436	619	10,056	3.1	12.6	18.6	37.8	1	1	507	16	523	$97,266	$3,262	$100,527
9	Auto Dealers (retail trade)	21,622	3,942	25,564	2.9	11.9	17.7	35.8	1	1	1,223	110	1,333	$234,798	$21,924	$256,722
10	Publishing (printed matter)	7,562	1,161	8,723	0.5	4.9	3.1	14.6	1	1	2,444	79	2,524	$469,262	$15,810	$485,072
11	Business Services (copy shops)	1,964	378	2,342	0.5	4.7	3.0	14.1	1	1	661	27	688	$126,859	$5,334	$132,193
12	Auto Repair & Maintenance	74,283	162	74,445	2.8	11.4	17.1	34.1	1	1	4,352	5	4,357	$835,593	$944	$836,536
13	Military Bases	245	298	543	3.6	14.6	21.4	43.8	1	2	11	14	25	$2,199	$2,709	$4,909
	Subtotals =	201,221	25,004	226,225	2.0	11.4	11.9	34.3			17,105	860	17,965	$3,284,111	$171,101	$3,455,212

Paperwork Burden Unit Cost ($/manifest) for the RCRA Hazardous Waste Manifest			
Item	Entities Which Incur Portions of Manifest Paperwork Cost (types of facilities involved in manifest transport custody chain from cradle-to-grave movement of waste)	Average Cost* Per Manifest (year 2000$)	
		SQG	LQG
1	Waste generators (Note: the average unit cost* for manifesting solvent-contaminated spent industrial wipes is mostly associated with RCRA small quantity generators (SQGs) because 96.5% of spent industrial wipes generators are small companies.)	$17	$24
2	Waste transporters	$117	
3	Waste receivers (for offsite treatment, storage, disposal, recycling of wastes) (Note: average for small, medium & large waste treatment, storage, disposal facilities (TSDFs))	$48	
4	State governments (Note: as of 2001, 24 states print, distribute, and collect RCRA manifests, compared to 48 states** reporting RCRA hazardous waste shipments within or between states, in the USEPA Office of Solid Waste 1999 RCRA Hazardous Waste Biennial Report.)	$10	
	Column total =	**$192**	**$199**

Explanatory Notes:

(a) Source: Derived from USEPA "Hazardous Waste Manifest Cost Benefit Analysis", prepared for the Office of Solid Waste, Hazardous Waste Identification Division, by Logistics Management Institute (McLean VA), Oct 2000, Table 3-9, page 3-7, http://www.epa.gov/epaoswer/hazwaste/gener/manifest/pdf/cba-rprt.pdf.

- The unit costs above include the following labor and equipment cost components: (1) preparing the manifest, (2) transmitting the manifest between waste generator, waste transporter, and final waste processing (treating, disposing, recycling) facility, (3) manifest recordkeeping for minimum of three years, (4) obtaining manifest forms, (5)submitting copies of final signed manifests to state agencies (required by some states), and (6) employee haz materials training (USDOT requires recurrent every three years).
- The unit costs above do not include the "information technology" component of unit cost from this source document for some companies which may process manifests electronically.

(b) * The unit costs in this table do not include allocated costs incurred by some companies for purchasing, installing, operating, and maintaining information technology (computer) systems, which may be used in part or whole, for manifest processing. As of 1996 there were 28 IT vendor companies providing waste manifesting software systems ("Waste Manifest Software Report", Donley Technology, June 1996 http://www.donleytech.com/de00014 and http://www.donleytech.com/wmsr). For example, IT costs for manifest processing for a hazardous waste generating company could include:

- hardware: $5,000 desktop computer w/printer and internet browser @five-year annualized cost of $1,000 and allocates 5% of the annual cost ($1,000 x 5% = $50) to manifest processing, plus:,
- software: Option A: $495/year internet-hosted waste management software service, which is equivalent to $10.48 in IT unit cost per manifest, for processing 52 manifests per year (i.e. one waste pick-up manifest processed per week); (i.e. ($50 hardware + $495 software)/52); or
  Option B: $6,500 licensed copy of waste management software @ five year annualized cost $1,300, plus 15% annual software support cost $975, results in $2,325 annual cost, which is equivalent to $44.71 in IT unit cost per manifest, for processing 52 manifests per year (i.e. ($50 hardware + ($1,300 + $975) software)/52).

(c) A total 48 of the 56 states/territories reported receiving waste shipments (within plus out-of-state shipments) in the 1999 Biennial Report. However, final waste destinations (waste receipts) are concentrated in only a few states: the top-5 waste receiving states (OH, TX, MI, IN, CA) account for 46% (3.01 of the 6.55 million tons received in 1999).

LABOR COST FOR DECANTING SPENT SOLVENT WIPES ACCUMULATION CONTAINERS								
			Annual Labor Hours*			Annual Labor Cost		
		Percent accumulation containers needing decanting	5	5	<Minutes per container to decant	$15	$15	<$/hour
Item	Subsector or Industry		SQGs	LQGs	Totals	SQGs	LQGs	Totals
Disposable Wipes:								
1	Printing	100%	256	34	290	$3,960	$520	$4,480
2	Chemical & Allied Products	50%	28	12	39	$428	$178	$606
3	Plastics & Rubber	50%	38	9	47	$586	$142	$728
4	Fabricated Metal Products	50%	132	18	150	$2,046	$275	$2,321
5	Industrial Machinery & Eqpt	50%	84	5	89	$1,298	$77	$1,375
6	Electronics & Computers	50%	30	22	53	$471	$342	$813
7	Transportation Eqpt	50%	26	13	39	$399	$196	$596
8	Furniture & Fixtures	50%	45	3	48	$693	$45	$738
9	Auto Dealers (retail trade)	50%	103	19	121	$1,588	$289	$1,877
10	Publishing (printed matter)	100%	130	20	150	$2,009	$308	$2,317
11	Business services (copy shops)	100%	34	6	40	$522	$100	$622
12	Auto Repair & Maintenance	50%	353	1	353	$5,455	$12	$5,467
13	Military Bases	50%	1	1	3	$18	$22	$40
	Disposable wipes subtotals =		1,259	162	1,421	$19,473	$2,508	**$21,981**
Reusable Wipes:								
1	Printing	100%	135,032	8,446	143,478	$2,088,752	$130,654	$2,219,406
2	Chemical & Allied Products	50%	5,035	1,348	6,383	$77,888	$20,853	$98,741
3	Plastics & Rubber	50%	6,888	1,076	7,964	$106,546	$16,641	$123,187
4	Fabricated Metal Products	50%	24,053	2,080	26,134	$372,071	$32,179	$404,250
5	Industrial Machinery & Eqpt	50%	15,259	583	15,843	$236,041	$9,021	$245,062
6	Electronics & Computers	50%	5,545	2,583	8,128	$85,778	$39,949	$125,727
7	Transportation Eqpt	50%	4,690	1,485	6,175	$72,554	$22,966	$95,520
8	Furniture & Fixtures	50%	8,148	343	8,492	$126,045	$5,313	$131,359
9	Auto Dealers (retail trade)	50%	18,663	2,189	20,852	$288,688	$33,860	$322,548
10	Publishing (printed matter)	100%	68,456	4,984	73,440	$1,058,921	$77,090	$1,136,011
11	Business services (copy shops)	100%	17,804	1,618	19,422	$275,398	$25,027	$300,425
12	Auto Repair & Maintenance	50%	64,128	91	64,219	$991,973	$1,407	$993,380
13	Military Bases	50%	212	164	376	$3,284	$2,539	$5,823
	Reusable wipes subtotals =		373,914	26,990	400,905	$5,783,940	$417,500	**$6,201,440**

* Annual labor hours estimated in this table by multiplying the percentage of non-“dry” wipes containers needing decanting, by the number of containers estimated for Impact Element 2.

COST TO SPENT WIPES GENERATORS TO MANAGE SPENT SOLVENT "FREE LIQUIDS" RECOVERED FROM ON-SITE GENERATOR ACCUMULATION CONTAINERS

Size of reference container (gallons) =		10	21		B. Gallons Solvent Captured by Decanting				C. Fuel Blender Cost ($/year): > If RCRA "haz waste" blending			D. Net Cost Solvent Recycling: > If RCRA "haz waste" recycling		
Spent disposable wipes/container =		505	1,060											
		A. Wipes Accumulation Containers Filled/Year							$0.91	$0.91	< $/gal	($1.55)	($1.55)	< $/gal
Item	Sub-sector	SQGs	LQGs	Subtotals	Avg gals free liquids per contr	SQGs	LQGs	Subtotals	SQGs	LQGs	Subtotals	SQGs	LQGs	Subtotals
DISPOSABLE INDUSTRIAL WIPES:														
1	Printing	3,072	403	3,475	5	2,793	769	3,562	$2,550	$703	$3,252	($2,065)	($569)	($2,634)
2	Chemical & Allied Products	665	276	941	0.5	60	53	113	$55	$48	$103	($45)	($39)	($84)
3	Plastics & Rubber	909	221	1,130	0.5	83	42	125	$75	$38	$114	($61)	($31)	($92)
4	Fabricated Metal Products	3,174	426	3,601	0.5	289	81	370	$263	$74	$338	($213)	($60)	($274)
5	Industrial Machinery & Eqpt	2,014	120	2,134	0.5	183	23	206	$167	$21	$188	($135)	($17)	($152)
6	Electronics & Computers	731	530	1,262	0.5	66	101	168	$61	$92	$153	($49)	($75)	($124)
7	Transportation Eqpt	619	305	924	0.5	56	58	115	$51	$53	$105	($42)	($43)	($85)
8	Furniture & Fixtures	1,075	71	1,146	0.5	98	13	111	$89	$12	$102	($72)	($10)	($82)
9	Auto Dealers (retail trade)	2,464	449	2,913	0.5	224	86	310	$204	$78	$283	($166)	($63)	($229)
10	Publishing (printed matter)	1,558	239	1,797	5	1,417	457	1,873	$1,293	$417	$1,710	($1,047)	($338)	($1,385)
11	Business services (copy shops)	405	78	483	5	368	149	517	$336	$136	$472	($272)	($110)	($382)
12	Auto Repair & Maintenance	8,464	18	8,482	0.5	769	4	773	$702	$3	$706	($569)	($3)	($571)
13	Military Bases	28	34	62	0.5	3	6	9	$2	$6	$8	($2)	($5)	($7)
	Disposable sub-totals =	25,178	3,171	28,349		6,409	1,843	8,251		Annual cost =	**$7,533**		Annual cost =	**($6,100)**
							Ton equivalent >	32						
Size of reference container (gallons) =		10	21		B. Gallons Solvent Captured by Decanting				C. Fuel Blender Cost ($/year): > If RCRA "haz waste" blending			D. Net Cost Solvent Recycling: > If RCRA "haz waste" recycling		
Spent reusable wipes/container =		175	367											
% of wipes not accumulated in containers =		50%	50%											
		A. Wipes Accumulation Containers Filled/Year							$0.91	$0.91	< $/gal	($0.74)	($0.74)	< $/gal
Item	Sub-sector	SQGs	LQGs	Subtotals	Avg gals free liquids per container	SQGs	LQGs	Subtotals	SQGs	LQGs	Subtotals	SQGs	LQGs	Subtotals
REUSABLE INDUSTRIAL WIPES:														
1	Printing	1,620,379	101,357	1,721,736	5	1,473,072	193,500	1,666,571	$1,344,915	$176,665	$1,521,580	($1,089,091)	($143,061)	($1,232,152)
2	Chemical & Allied Products	120,846	32,353	153,200	0.5	10,986	6,177	17,163	$10,030	$5,639	$15,669	($8,122)	($4,567)	($12,689)
3	Plastics & Rubber	165,309	25,820	191,128	0.5	15,028	4,929	19,957	$13,721	$4,500	$18,221	($11,111)	($3,644)	($14,755)
4	Fabricated Metal Products	577,279	49,926	627,206	0.5	52,480	9,531	62,011	$47,914	$8,702	$56,616	($38,800)	($7,047)	($45,847)
5	Industrial Machinery & Eqpt	366,225	13,996	380,220	0.5	33,293	2,672	35,965	$30,397	$2,439	$32,836	($24,615)	($1,975)	($26,590)
6	Electronics & Computers	133,086	61,982	195,069	0.5	12,099	11,833	23,932	$11,046	$10,803	$21,850	($8,945)	($8,748)	($17,694)
7	Transportation Eqpt	112,570	35,632	148,202	0.5	10,234	6,803	17,036	$9,343	$6,211	$15,554	($7,566)	($5,029)	($12,595)
8	Furniture & Fixtures	195,563	8,244	203,807	0.5	17,778	1,574	19,352	$16,232	$1,437	$17,669	($13,144)	($1,164)	($14,308)
9	Auto Dealers (retail trade)	447,908	52,535	500,443	0.5	40,719	10,029	50,748	$37,176	$9,157	$46,333	($30,105)	($7,415)	($37,520)
10	Publishing (printed matter)	821,473	59,804	881,277	5	746,793	114,171	860,964	$681,822	$104,238	$786,060	($552,129)	($84,410)	($636,540)
11	Business services (copy shops)	213,644	19,415	233,059	5	194,222	37,065	231,287	$177,325	$33,841	$211,165	($143,595)	($27,404)	($170,998)
12	Auto Repair & Maintenance	1,539,074	2,183	1,541,258	0.5	139,916	417	140,333	$127,743	$381	$128,124	($103,444)	($308)	($103,753)
13	Military Bases	5,096	3,939	9,035	0.5	463	752	1,215	$423	$687	$1,110	($343)	($556)	($898)
	Reusable sub-totals =	6,318,451	467,187	6,785,638		2,747,083	399,452	3,146,535		Annual cost =	**$2,872,787**		Annual cost =	**($2,326,339)**
							Ton equivalent >	12,271						

INITIAL YEAR EVALUATION OF SPENT SOLVENT WIPES CONTAINERS TO DETERMINE ELIGIBILITY WITH THE 5 GRAM "DRY" STANDARD: ONE-TIME CONTAINER SAMPLING UNIT COST PER-FACILITY			
		Disposable Wipes	
Item		SQG	LQG
A. Average Number Containers Sampled Per Facility:			
1	Average spent solvent wipes generated per week>	158	1,485
2	Avg size of wipes container (gal)>	10	21
3	Avg wipes per container>	505	1,060
4	Nr weeks to fill one container>	3.2	0.7
5	Nr. containers filled per year*>	15.7	70.1
B. Average Labor Time Needed To Sample Containers Per Facility:			
6	Number containers sampled in initial year**>	2	11
7	Number wipes sampled per container>	25	25
8	Avg minutes to weigh each sample wipe>	2	2
9	Total sampling minutes per container>	50	50
10	Total sampling hours per facility>	2.0	8.8
11	Sampling task mobilization/demobilization hours***>	2.2	9.6
12	Total sampling hours (items 10+11)>	4.1	18.4
C. Average Labor Time for Recordkeeping of Samples Per Facility:			
13	Recordkeeping hours****>	0.4	1.8
D. Average Container Sampling & Recordkeeping Cost Per Facility:			
14	Total hours for sampling & recordkeeping (items 12+13)>	4.5	20.2
15	Avg labor hourly wage rate (technical labor)>	$21.58	$21.58
16	Labor cost for total hours (item 14 x 15)>	**$98**	**$437**

Explanatory Notes:

(a) * Item 5 based on facility operating weeks per year = 50

(b) ** Item 6 based on sampling containers accumulated in initial year according to sampling rate = 15%.

(c) Items 7 & 8 number of, and time for, wipes sampled based on OSW-HWID judgement, based on fieldtrips.

(d) *** Item 11 based on assumed percentage of subtotal hours in item 10 = 10%

(e) **** Item 13 based on assumed percentage of total hours in item 12 = 10%

DISPOSABLE WIPES GENERATORS: INITIAL ASSESSMENT COST TO DETERMINE COMPLIANCE WITH 5 GRAM "DRY" STANDARD								
		A. Facilities Using Solvent Wipes:			B. % of Facilities which choose to sample	C. Sampling Cost (initial year):		
Item	Sub-sector	SQGs	LQGs	Subtotals		SQGs	LQGs	Subtotals
A. IF GENERATOR FACILITIES ASSESS INDIVIDUALLY:								
					Avg samping cost per facility (see prior spreadsheet) >	$98	$437	
1	Printing	2,158	30	2,188	0%	$0	$0	$0
2	Chemical & Allied Products	155	16	171	100%	$15,159	$6,977	$22,136
3	Plastics & Rubber	209	13	222	100%	$20,397	$5,476	$25,873
4	Fabricated Metal Products	758	25	783	100%	$73,969	$10,993	$84,961
5	Industrial Machinery & Eqpt	374	5	380	100%	$36,505	$2,399	$38,904
6	Electronics & Computers	72	13	84	100%	$6,984	$5,587	$12,570
7	Transportation Eqpt	156	19	175	100%	$15,209	$8,274	$23,483
8	Furniture & Fixtures	253	4	257	100%	$24,717	$1,789	$26,505
9	Auto Dealers (retail trade)	611	28	639	100%	$59,665	$12,025	$71,690
10	Publishing (printed matter)	1,222	20	1,242	0%	$0	$0	$0
11	Business services (copy shops)	330	7	337	0%	$0	$0	$0
12	Auto Repair & Maintenance	2,176	1	2,177	100%	$212,335	$518	$212,853
13	Military Bases	6	2	7	100%	$559	$743	$1,302
	Disposable Sub-Totals =	8,481	182	8,663		$465,499	$54,779	**$520,278**
							Average annualized cost =	**$69,230**
					Subtotal sampling facilities =	4,896	Avg per facility =	$106
B. IF INDEPENDENT ORGANIZATION ASSESSES SUB-SECTORS COLLECTIVELY								
					Avg samping cost per facility (see prior spreadsheet) >	$98	$437	
1	Printing	2,158	30	2,188	10%	$21,057	$1,316	$22,373
2	Chemical & Allied Products	155	16	171	10%	$1,516	$698	$2,214
3	Plastics & Rubber	209	13	222	10%	$2,040	$548	$2,587
4	Fabricated Metal Products	758	25	783	10%	$7,397	$1,099	$8,496
5	Industrial Machinery & Eqpt	374	5	380	10%	$3,651	$240	$3,890
6	Electronics & Computers	72	13	84	10%	$698	$559	$1,257
7	Transportation Eqpt	156	19	175	10%	$1,521	$827	$2,348
8	Furniture & Fixtures	253	4	257	10%	$2,472	$179	$2,651
9	Auto Dealers (retail trade)	611	28	639	10%	$5,967	$1,203	$7,169
10	Publishing (printed matter)	1,222	20	1,242	10%	$11,925	$867	$12,792
11	Business services (copy shops)	330	7	337	10%	$3,224	$293	$3,516
12	Auto Repair & Maintenance	2,176	1	2,177	10%	$21,233	$52	$21,285
13	Military Bases	6	2	7	10%	$56	$74	$130
	Disposables Sub-Totals =	8,481	182	8,663		$82,755	$7,953	**$90,708**
							Average annualized cost =	**$12,070**
					Subtotal sampling facilities =	866	Avg per facility =	$105

AVOIDED COST FOR RCRA HAZARDOUS WASTE DISPOSAL OF SPENT DISPOSABLE WIPES

A. ANNUAL RCRA SOLVENT WASTE SPENT DISPOSABLE WIPES QUANTITIES:

			A1. Annual Solvent Industrial Wipes			A2. Annual Wipes Weight (tons)			A3. Annual containers			A4. RCRA Subtitle C Incineration Cost		
						0.054	0.054	<lbs/wipe	34	34	<Avg contr gals	$149	$149	<Avg $/drum*
			SQGs	LQGs	Totals	SQGs	LQGs	Totals	1144	1144	<Wipes/contnr	SQGs	LQGs	Totals
Printer>	1	Printing	17,050,706	2,237,036	19,287,742	461	60	521	14,909	1,956	16,865	$2,221,471	$291,455	$2,512,926
Non-printer>	2	Chemical & Allied Products	6,670,343	2,774,685	9,445,028	180	75	255	5,833	2,426	8,259	$869,053	$361,503	$1,230,557
Non-printer>	3	Plastics & Rubber	9,126,711	2,213,612	11,340,323	247	60	306	7,980	1,936	9,916	$1,189,084	$288,403	$1,477,487
Non-printer>	4	Fabricated Metal Products	31,860,977	4,278,850	36,139,827	861	116	977	27,859	3,741	31,601	$4,151,045	$557,475	$4,708,520
Non-printer>	5	Industrial Machinery & Eqpt	20,211,978	1,205,430	21,417,408	546	33	579	17,673	1,054	18,727	$2,633,341	$157,051	$2,790,392
Non-printer>	6	Electronics & Computers	7,338,580	5,324,609	12,663,188	198	144	342	6,417	4,656	11,073	$956,115	$693,723	$1,649,838
Non-printer>	7	Transportation Eqpt	6,217,398	3,059,700	9,277,098	168	83	251	5,437	2,675	8,112	$810,041	$398,637	$1,208,678
Non-printer>	8	Furniture & Fixtures	10,791,594	708,371	11,499,965	292	19	311	9,436	619	10,056	$1,405,995	$92,291	$1,498,286
Non-printer>	9	Auto Dealers (retail trade)	24,728,040	4,507,886	29,235,926	668	122	790	21,622	3,942	25,564	$3,221,722	$587,315	$3,809,037
Printer>	10	Publishing (printed matter)	8,648,444	1,327,236	9,975,680	234	36	270	7,562	1,161	8,723	$1,126,773	$172,921	$1,299,693
Printer>	11	Business services (copy shops)	2,245,659	432,263	2,677,922	61	12	72	1,964	378	2,342	$292,578	$56,318	$348,896
Non-printer>	12	Auto Repair & Maintenance	84,952,959	185,106	85,138,065	2,296	5	2,301	74,283	162	74,445	$11,068,196	$24,117	$11,092,312
Non-printer>	13	Military Bases	280,243	341,166	621,409	8	9	17	245	298	543	$36,512	$44,449	$80,961
		Column totals =	230,123,632	28,595,951	**258,719,583**	6,220	773	**6,992**	201,221	25,004	**226,225**	$29,981,926	$3,725,657	**$33,707,583**

B. SAVINGS FOR DISPOSAL OF DISPOSABLE SPENT WIPES AT MUNICIPAL COMBUSTOR:

			Landfill Disposal In-Eligibility Conditions			B2. Annual Number Containers			B3. Municipal Combustor Cost		
		Estimated % wipes containing landfill-ineligible solvents =			11%						
		Estimated % printer disposable wipes generated "not dry" =			100%						
		Estimated % non-printer disposable wipes generated "not dry" =			50%	34	34	<Contnr gals	$55	$55	<Avg $/ton
		DISPOSABLE INDUSTRIAL WIPES:	B1. Annual Eligible Solvent Wipes			1144	1144	<Wipes/contnr	$5.50	$5.50	<Avg $/drum
			SQGs	LQGs	Totals	SQGs	LQGs	Totals	SQGs	LQGs	Totals
Printer>	1	Printing	17,050,706	2,237,036	19,287,742	14,909	1,956	16,865	$82,001	$10,758	$92,759
Non-printer>	2	Chemical & Allied Products	3,688,283	1,534,228	5,222,511	3,225	1,342	4,567	$17,738	$7,378	$25,116
Non-printer>	3	Plastics & Rubber	5,046,501	1,223,989	6,270,490	4,413	1,070	5,483	$24,270	$5,886	$30,156
Non-printer>	4	Fabricated Metal Products	17,617,131	2,365,937	19,983,068	15,404	2,069	17,473	$84,725	$11,378	$96,103
Non-printer>	5	Industrial Machinery & Eqpt	11,175,962	666,528	11,842,489	9,772	583	10,355	$53,748	$3,205	$56,953
Non-printer>	0	Electronics & Computers	4,057,776	2,944,176	7,001,952	3,548	2,574	6,123	$19,515	$14,159	$33,674
Non-printer>	7	Transportation Eqpt	3,437,833	1,691,823	5,129,656	3,006	1,479	4,485	$16,533	$8,136	$24,670
Non-printer>	8	Furniture & Fixtures	5,967,077	391,685	6,358,762	5,218	342	5,560	$28,697	$1,884	$30,581
Non-printer>	9	Auto Dealers (retail trade)	13,673,062	2,492,579	16,165,642	11,956	2,180	14,135	$65,757	$11,987	$77,744
Printer>	10	Publishing (printed matter)	8,648,444	1,327,236	9,975,680	7,562	1,161	8,723	$41,592	$6,383	$47,975
Printer>	11	Business services (copy shops)	2,245,659	432,263	2,677,922	1,964	378	2,342	$10,800	$2,079	$12,879
Non-printer>	12	Auto Repair & Maintenance	46,973,682	102,352	47,076,034	41,074	89	41,163	$225,907	$492	$226,399
Non-printer>	13	Military Bases	154,957	188,643	343,601	135	165	300	$745	$907	$1,652
		Column totals =	139,737,074	17,598,476	157,335,550	122,187	15,388	137,575	$672,026	$84,635	**$756,661**

C. SAVINGS FOR DISPOSAL OF DISPOSABLE SPENT WIPES AT NON-HAZ WASTE LANDFILL:

			Landfill Disposal Eligibility Conditions:			C2. Annual Number Containers:			C3. Non-Haz Waste Landfill Cost			C4. Avoided Dispsl Cost (B1-C3-D3-A6)		
		Estimated % spent wipes contaminated with landfill-eligible solvents =			89%									
		Estimated % printer disposable spent wipes generated "dry" =			0%									
		Estimated % non-printer disposable spent wipes generated "dry" =			50%	34	34	<Contnr gals	$29	$29	<Avg $/ton			
		DISPOSABLE INDUSTRIAL WIPES:	C1. Annual Eligible Solvent Wipes			1144	1144	<Wipes/contnr	$2.90	$2.90	<Avg $/drum			
			SQGs	LQGs	Totals	SQGs	LQGs	Totals	SQGs	LQGs	Totals	SQGs	LQGs	Totals
Printer>	1	Printing	0	0	0	0	0	0	$0	$0	$0	$2,157,762	$283,096	$2,440,859
Non-printer>	2	Chemical & Allied Products	2,982,060	1,240,458	4,222,517	2,608	1,085	3,692	$7,562	$3,146	$10,707	$850,910	$353,956	$1,204,865
Non-printer>	3	Plastics & Rubber	4,080,210	989,623	5,069,832	3,568	865	4,433	$10,346	$2,509	$12,856	$1,164,259	$282,382	$1,446,641
Non-printer>	4	Fabricated Metal Products	14,243,846	1,912,913	16,156,759	12,455	1,673	14,128	$36,119	$4,851	$40,970	$4,064,381	$545,836	$4,610,217
Non-printer>	5	Industrial Machinery & Eqpt	9,036,016	538,902	9,574,919	7,901	471	8,372	$22,913	$1,367	$24,280	$2,578,363	$153,772	$2,732,135
Non-printer>	6	Electronics & Computers	3,280,803	2,380,433	5,661,236	2,869	2,081	4,950	$8,319	$6,036	$14,356	$936,154	$679,240	$1,615,394
Non-printer>	7	Transportation Eqpt	2,779,565	1,367,877	4,147,442	2,430	1,196	3,627	$7,048	$3,469	$10,517	$793,129	$390,314	$1,183,443
Non-printer>	8	Furniture & Fixtures	4,824,516	316,686	5,141,202	4,219	277	4,495	$12,234	$803	$13,037	$1,376,642	$90,364	$1,467,006
Non-printer>	9	Auto Dealers (retail trade)	11,054,978	2,015,306	13,070,284	9,667	1,762	11,429	$28,033	$5,110	$33,143	$3,154,460	$575,053	$3,729,513
Printer>	10	Publishing (printed matter)	0	0	0	0	0	0	$0	$0	$0	$1,094,458	$167,961	$1,262,420
Printer>	11	Business services (copy shops)	0	0	0	0	0	0	$0	$0	$0	$284,188	$54,703	$338,890
Non-printer>	12	Auto Repair & Maintenance	37,979,277	82,754	38,062,031	33,209	72	33,282	$96,307	$210	$96,517	$10,837,118	$23,613	$10,860,731
Non-printer>	13	Military Bases	125,286	152,522	277,809	110	133	243	$318	$387	$704	$35,750	$43,521	$79,271
		Column totals =	90,386,558	10,997,475	101,384,033	79,034	9,616	88,651	$229,200	$27,887	**$257,087**	$29,327,573	$3,643,812	**$32,971,385**
		% of total disposable solvent wipes =	39%	38%	39%									
		Total C COMBUST + D LANDFILL =	230,123,632	28,595,951	258,719,583	201,221	25,004	226,225	$901,226	$112,522	$1,013,748			

* Subtitle C hazardous waste incineration unit cost ($/drum) is average for drummed halogen organics & drummed non-halogen organics, from Sept 2000 national cost survey by Environmental Technology Council (http://www.etc.org/costsurvey4.cfm).

Summary of Rates (Tipping Fees) for Solid Waste Managed in Non-Hazardous Waste Facilities in the USA
Source: "Solid Waste Price Index" August 1997 regular posted gate rates ($/ton), Solid Waste Digest, Vol.7, Nr.8., Aug 1997

		Incinerators (Combustors)						Landfills					
Item	State	Nr. of facilities	Intake TPD	Minimum ($/ton)	Average ($/ton)	Maximum ($/ton)	Average as % above min in range	Nr. of facilities	Intake TPD	Minimum ($/ton)	Average ($/ton)	Maximum ($/ton)	Average as % above min in range
1	AL	1	550	$39.90	$39.90	$39.90		11	15,680	$23.00	$28.66	$45.00	26%
2	AK	0						1	1,710	$27.21	$27.21	$27.21	
3	AZ	0						5	12,300	$16.25	$20.22	$26.25	40%
4	AR	0						2	5,830	$20.50	$22.79		
5	CA	4	4,590	$27.75	$35.75	$49.75	36%	41	124,330	$17.57	$28.40	$60.00	26%
6	CO	0						7	17,250		$13.83		
7	CT	4	6,440	$51.00	$65.66	$84.00	44%	0					
8	DE	0						2	2,130		$56.91	$58.50	
9	FL	9	17,470	$23.00	$57.66	$79.00	62%	23	33,340	$23.00	$44.16	$84.15	35%
10	GA	0						11	28,920	$29.00	$30.05	$39.50	10%
11	HI	1	2,000	$55.25	$55.25	$55.25		0					
12	ID	0						1	3,650	$24.44	$24.44	$24.44	
13	IL	1	2,000	$56.75	$56.75	$56.75		21	46,780	$10.05	$29.80	$50.00	49%
14	IN	1	2,360	$25.00	$25.00	$25.00		15	32,020	$20.00	$27.91	$34.60	54%
15	IA	0						4	8,930	$29.00	$31.35	$35.00	39%
16	KS	0						6	11,660	$21.25	$24.75	$36.00	24%
17	KY	0						8	14,620	$25.00	$28.12	$33.00	39%
18	LA	0						7	10,800	$13.47	$20.85	$27.50	53%
19	ME	2	2,600	$40.00	$45.50	$55.00	37%	0					
20	MD	2	4,100	$44.00	$56.19	$67.50	52%	4	9,370	$45.00	$49.95	$59.00	35%
21	MA	6	8,930	$50.00	$58.20	$76.00	32%	5	8,670	$35.00	$56.96	$110.00	29%
22	MI	2	4,970		$44.99	$59.51		15	28,990	$25.50	$31.39	$55.00	20%
23	MN	2	3,320	$60.00	$92.26			4	4,840	$52.00	$57.11	$70.63	27%
24	MS	0						4	7,200	$19.98	$22.29	$30.00	23%
25	MO	0						4	12,220	$18.50	$25.13		
26	MT	0						2	2,960		$16.64		
27	NE	0						2	6,410		$23.46		
28	NV	0						3	11,660		$10.59		
29	NH	1	900	$42.48	$42.48	$42.48		2	5,370	$50.00	$51.58	$56.00	26%
30	NJ	4	7,140	$72.75	$82.76	$101.32	35%	5	9,530	$49.50	$68.25	$94.01	42%
31	NM	0						4	8,600		$19.70		
32	NY	8	15,330	$53.78	$67.72	$85.00	45%	11	24,820	$40.00	$89.40		
33	NC	0						8	22,060	$25.00	$29.57	$37.00	38%
34	ND	0						1	2,000	$23.83	$23.83	$23.83	
35	OH	2	2,790	$39.50	$39.50	$39.50		19	42,210	$20.00	$30.46	$47.50	38%
36	OK	1	1,370	$42.00	$42.00	$42.00		4	11,040		$19.81		
37	OR	1	650	$67.23	$67.23	$67.23		5	11,700	$25.00	$27.86	$45.00	14%
38	PA	5	9,080	$56.00	$60.63	$69.00	36%	31	68,730	$26.00	$48.99	$100.00	31%
39	RI	0						1	3,490	$39.50	$39.50	$39.50	
40	SC	1	820	$51.50	$51.50	$51.50		7	14,660	$20.00	$29.28	$47.00	34%
41	SD	0						1	1,930	$27.65	$27.65	$27.65	
42	TN	1	1,330	$36.98	$36.98	$36.98		6	17,270	$26.50	$28.82	$34.65	28%

Item	State	Incinerators (Combustors)						Landfills					
		Nr. of facilities	Intake TPD	Minimum ($/ton)	Average ($/ton)	Maximum ($/ton)	Average as % above min in range	Nr. of facilities	Intake TPD	Minimum ($/ton)	Average ($/ton)	Maximum ($/ton)	Average as % above min in range
43	TX	0						41	68,010	$15.00	$23.15	$56.00	20%
44	UT	0						5	18,000	$19.00	$28.31	$35.00	58%
45	VA	3	5,730	$25.00	$37.72	$45.05	63%	14	33,610	$28.50	$39.33	$53.00	44%
46	WA	1	1,710	$97.00	$97.00	$97.00		6	12,520	$20.66	$45.43	$80.00	42%
47	WV	0						1	5,430	$40.31	$40.31	$40.31	
48	WI	0						15	21,690	$18.50	$32.51	$46.00	51%
Summary Statistics:													
	Total =	63	106,180					395	864,940				
	Minimum=			$23.00	$25.00	$25.00	32%			$10.05	$10.59	$23.83	10%
	Maximum=			$97.00	$97.00	$101.32	63%			$52.00	$89.40	$110.00	58%
	Simple mean =			$48.04	$54.72	$60.21	55%			$26.60	$33.26	$49.12	30%
	TPD-wgtd mean =			$43.28	$58.39	$68.44	60%			$27.58	$46.59	$56.51	66%
	Median=			$47.00	**$55.25**	$56.00	92%			$24.72	**$28.66**	$45.00	19%
						Median as % between min and max =	**41%**				Median as % between min and max =		**19%**

Explanatory Notes:

(a) Note: This table excludes cost data for facilities with tip fees reported as (a) $/CY basis, (b) "no charge" (i.e. $0/ton), and (c) "unknown".

(b) Facility count in each column in this table represents all facilities listed in the source document, regardless of cost basis.

(c) TPD = tons per day; multiply by 250 days/year (5 days/week x 50 wks/year), to 312 days/year (6days/week x 52 wks/year), for annual tons.

(d) Solid Waste Digest publishing company Chartwell Information Publishers (Alexandria VA) collected data by phone survey of facilities.
Prices above represent commercial (i.e. non-residential) rates, and include any sales taxes, surcharges, state licensing fees, or permit fees.

ESTIMATED COST TO INDUSTRIAL LAUNDRIES FOR DECANTING & MANAGING PERCOLATED SPENT SOLVENT "FREE LIQUIDS" FROM REUSABLE WIPES TRANSPORT CONTAINERS

A. Annual Quantity of Percolated Spent Solvent "Free Liquids" Recovered from Transport Containers:

REUSABLE WIPES:		A1. Annual nr. wipes laundered:			A2. Nr. container equivalents:			A3. Annual nr. containers w/free liquids:				A4. Annual gallons solvent free liquids:			
					960	960	<wipes/contnr	% containers				Gallons per			
Item	Sub-sector	SQGs	LQGs	Totals	SQGs	LQGs	Totals	free liquids	SQGs	LQGs	Totals	55-gal contnr	SQGs	LQGs	Totals
1	Printing	565,659,591	74,303,831	639,963,423	589,229	77,400	666,629	5.0%	29,461	3,870	33,331	3	88,384	11,610	99,994
2	Chemical & Allied Products	42,186,313	23,718,009	65,904,321	43,944	24,706	68,650	2.5%	1,099	618	1,716	1	1,099	618	1,716
3	Plastics & Rubber	57,707,802	18,928,159	76,635,961	60,112	19,717	79,829	2.5%	1,503	493	1,996	1	1,503	493	1,996
4	Fabricated Metal Products	201,522,873	36,600,626	238,123,499	209,920	38,126	248,045	2.5%	5,248	953	6,201	1	5,248	953	6,201
5	Industrial Machinery & Eqpt	127,845,668	10,260,172	138,105,840	133,173	10,688	143,860	2.5%	3,329	267	3,597	1	3,329	267	3,597
6	Electronics & Computers	46,459,279	45,438,499	91,897,779	48,395	47,332	95,727	2.5%	1,210	1,183	2,393	1	1,210	1,183	2,393
7	Transportation Eqpt	39,297,004	26,121,783	65,418,787	40,934	27,210	68,145	2.5%	1,023	680	1,704	1	1,023	680	1,704
8	Furniture & Fixtures	68,269,281	6,043,292	74,312,573	71,114	6,295	77,409	2.5%	1,778	157	1,935	1	1,778	157	1,935
9	Auto Dealers (retail trade)	156,360,483	38,513,024	194,873,507	162,876	40,118	202,993	2.5%	4,072	1,003	5,075	1	4,072	1,003	5,075
10	Publishing (printed matter)	286,768,691	43,841,615	330,610,306	298,717	45,668	344,386	5.0%	14,936	2,283	17,219	3	44,808	6,850	51,658
11	Business services (copy shops)	74,581,196	14,233,053	88,814,248	77,689	14,826	92,515	5.0%	3,884	741	4,626	3	11,653	2,224	13,877
12	Auto Repair & Maintenance	537,276,832	1,600,626	538,877,458	559,663	1,667	561,331	2.5%	13,992	42	14,033	1	13,992	42	14,033
13	Military Bases	1,778,937	2,887,726	4,666,663	1,853	3,008	4,861	2.5%	46	75	122	1	46	75	122
	Subtotals =	2,205,713,949	342,490,416	2,548,204,365	2,297,619	356,761	2,654,380	3.5%	81,581	12,366	93,948	2.2	178,145	26,156	204,301

B. Annual Cost for Management of Decanted "Free Liquids": 55-gal container eqvlnts = 3,715

REUSABLE WIPES:		B1. Cost of Haz Fuel Blending:			B2. Cost of Non-Haz Fuel Blending:			B3. Cost of Haz Solvent Recovery:			B4. Cost of Non-haz Solvent Recovery:			Tons eqvltn=	797
		$0.91	$0.91	< $/gal	$0.29	$0.29	< $/gal	($0.74)	($0.74)	< $/gal	($0.74)	($0.74)	< $/gal		
Item	Sub-sector	SQGs	LQGs	Totals	SQGs	LQGs	Totals	SQGs	LQGs	Totals	SQGs	LQGs	Totals		
1	Printing	$80,695	$10,600	$91,295	$25,190	$3,309	$28,498	($65,345)	($8,584)	($73,929)	($65,345)	($8,584)	($73,929)		
2	Chemical & Allied Products	$1,003	$564	$1,567	$313	$176	$489	($812)	($457)	($1,269)	($812)	($457)	($1,269)		
3	Plastics & Rubber	$1,372	$450	$1,822	$428	$140	$569	($1,111)	($364)	($1,476)	($1,111)	($364)	($1,476)		
4	Fabricated Metal Products	$4,791	$870	$5,662	$1,496	$272	$1,767	($3,880)	($705)	($4,585)	($3,880)	($705)	($4,585)		
5	Industrial Machinery & Eqpt	$3,040	$244	$3,284	$949	$76	$1,025	($2,461)	($198)	($2,659)	($2,461)	($198)	($2,659)		
6	Electronics & Computers	$1,105	$1,080	$2,185	$345	$337	$682	($895)	($875)	($1,769)	($895)	($875)	($1,769)		
7	Transportation Eqpt	$934	$621	$1,555	$292	$194	$486	($757)	($503)	($1,260)	($757)	($503)	($1,260)		
8	Furniture & Fixtures	$1,623	$144	$1,767	$507	$45	$552	($1,314)	($116)	($1,431)	($1,314)	($116)	($1,431)		
9	Auto Dealers (retail trade)	$3,718	$916	$4,633	$1,160	$286	$1,446	($3,010)	($742)	($3,752)	($3,010)	($742)	($3,752)		
10	Publishing (printed matter)	$40,909	$6,254	$47,164	$12,770	$1,952	$14,722	($33,128)	($5,065)	($38,192)	($33,128)	($5,065)	($38,192)		
11	Business services (copy shops)	$10,639	$2,030	$12,670	$3,321	$634	$3,955	($8,616)	($1,644)	($10,260)	($8,616)	($1,644)	($10,260)		
12	Auto Repair & Maintenance	$12,774	$38	$12,812	$3,988	$12	$3,999	($10,344)	($31)	($10,375)	($10,344)	($31)	($10,375)		
13	Military Bases	$42	$69	$111	$13	$21	$35	($34)	($56)	($90)	($34)	($56)	($90)		
	Subtotals =	$162,646	$23,880	$186,526	$50,771	$7,454	$58,226	($131,708)	($19,338)	($151,046)	($131,708)	($19,338)	($151,046)		

C. Annual Labor Cost for Decanting Percolated "Free Liquids" From Transport Containers:

REUSABLE WIPES:		C1. Annual Labor Hours:			C2. Annual Labor Cost:		
		5	5	<Minutes/contr	$15.47	$15.47	<$/hour
Item	Sub-sector	SQGs	LQGs	Totals	SQGs	LQGs	Totals
1	Printing	2,455	322	2,778	$37,977	$4,989	$42,966
2	Chemical & Allied Products	92	51	143	$1,416	$796	$2,212
3	Plastics & Rubber	125	41	166	$1,937	$635	$2,573
4	Fabricated Metal Products	437	79	517	$6,765	$1,229	$7,994
5	Industrial Machinery & Eqpt	277	22	300	$4,292	$344	$4,636
6	Electronics & Computers	101	99	199	$1,560	$1,525	$3,085
7	Transportation Eqpt	85	57	142	$1,319	$877	$2,196
8	Furniture & Fixtures	148	13	161	$2,292	$203	$2,495
9	Auto Dealers (retail trade)	339	84	423	$5,249	$1,293	$6,542
10	Publishing (printed matter)	1,245	190	1,435	$19,253	$2,943	$22,197
11	Business services (copy shops)	324	62	385	$5,007	$956	$5,963
12	Auto Repair & Maintenance	1,166	3	1,169	$18,036	$54	$18,090
13	Military Bases	4	6	10	$60	$97	$157
	Subtotals =	6,798	1,031	7,829	$105,163	$15,941	$121,103

ESTIMATED COST TO WASTE MANAGEMENT FACILITIES FOR DECANTING & MANAGING PERCOLATED SPENT SOLVENT "FREE LIQUIDS" FROM DISPOSABLE WIPES TRANSPORT CONTAINERS

A. Annual Quantity of Percolated Spent Solvent "Free Liquids" Recovered from Transport Containers:

DISPOSABLE WIPES:		A1. Annual nr. wipes laundered:			A2. Nr. container equivalents:			A3. Annual nr. containers w/free liquids:				A4. Annual gallons solvent free liquids:			
					2,775	2,775	<wipes/contnr	% containers				Gallons per			
Item	Sub-sector	SQGs	LQGs	Totals	SQGs	LQGs	Totals	free liquids	SQGs	LQGs	Totals	55-gal contnr	SQGs	LQGs	Totals
1	Printing	17,050,706	2,237,036	19,287,742	17,761	2,330	20,091	5.0%	888	117	1,005	3	2,664	350	3,014
2	Chemical & Allied Products	6,670,343	2,774,685	9,445,028	6,948	2,890	9,839	2.5%	174	72	246	1	174	72	246
3	Plastics & Rubber	9,126,711	2,213,612	11,340,323	9,507	2,306	11,813	2.5%	238	58	295	1	238	58	295
4	Fabricated Metal Products	31,860,977	4,278,850	36,139,827	33,189	4,457	37,646	2.5%	830	111	941	1	830	111	941
5	Industrial Machinery & Eqpt	20,211,978	1,205,430	21,417,408	21,054	1,256	22,310	2.5%	526	31	558	1	526	31	558
6	Electronics & Computers	7,338,580	5,324,609	12,663,188	7,644	5,546	13,191	2.5%	191	139	330	1	191	139	330
7	Transportation Eqpt	6,217,398	3,059,700	9,277,098	6,476	3,187	9,664	2.5%	162	80	242	1	162	80	242
8	Furniture & Fixtures	10,791,594	708,371	11,499,965	11,241	738	11,979	2.5%	281	18	299	1	281	18	299
9	Auto Dealers (retail trade)	24,728,040	4,507,886	29,235,926	25,758	4,696	30,454	2.5%	644	117	761	1	644	117	761
10	Publishing (printed matter)	8,648,444	1,327,236	9,975,680	9,009	1,383	10,391	5.0%	450	69	520	3	1,351	207	1,559
11	Business services (copy shops)	2,245,659	432,263	2,677,922	2,339	450	2,790	5.0%	117	23	139	3	351	68	418
12	Auto Repair & Maintenance	84,952,959	185,106	85,138,065	88,493	193	88,685	2.5%	2,212	5	2,217	1	2,212	5	2,217
13	Military Bases	280,243	341,166	621,409	292	355	647	2.5%	7	9	16	1	7	9	16
	Subtotals =	230,123,632	28,595,951	258,719,583	239,712	29,787	269,500	2.8%	6,721	849	7,569	1.4	9,631	1,265	10,897
														55-gal container eqvlnts =	198

B. Annual Cost for Management of Decanted "Free Liquids":

DISPOSABLE WIPES:		B1. Cost of Haz Fuel Blending:			B2. Cost of Non-Haz Fuel Blending:			B3. Cost of Haz Solvent Recovery:			B4. Cost of Non-haz Solvent Recovery:			Tons eqvltn=	42
		$0.91	$0.91	< $/gal	$0.29	$0.29	< $/gal	($0.74)	($0.74)	< $/gal	($0.74)	($0.74)	< $/gal		
Item	Sub-sector	SQGs	LQGs	Totals	SQGs	LQGs	Totals	SQGs	LQGs	Totals	SQGs	LQGs	Totals		
1	Printing	$2,432	$319	$2,752	$759	$100	$859	($1,970)	($258)	($2,228)	($1,970)	($258)	($2,228)		
2	Chemical & Allied Products	$159	$66	$225	$50	$21	$70	($128)	($53)	($182)	($128)	($53)	($182)		
3	Plastics & Rubber	$217	$53	$270	$68	$16	$84	($176)	($43)	($218)	($176)	($43)	($218)		
4	Fabricated Metal Products	$758	$102	$859	$236	$32	$268	($613)	($82)	($696)	($613)	($82)	($696)		
5	Industrial Machinery & Eqpt	$481	$29	$509	$150	$9	$159	($389)	($23)	($412)	($389)	($23)	($412)		
6	Electronics & Computers	$174	$127	$301	$54	$40	$94	($141)	($103)	($244)	($141)	($103)	($244)		
7	Transportation Eqpt	$148	$73	$221	$46	$23	$69	($120)	($59)	($179)	($120)	($59)	($179)		
8	Furniture & Fixtures	$257	$17	$273	$80	$5	$85	($208)	($14)	($221)	($208)	($14)	($221)		
9	Auto Dealers (retail trade)	$588	$107	$695	$184	$33	$217	($476)	($87)	($563)	($476)	($87)	($563)		
10	Publishing (printed matter)	$1,234	$189	$1,423	$385	$59	$444	($999)	($153)	($1,152)	($999)	($153)	($1,152)		
11	Business services (copy shops)	$320	$62	$382	$100	$19	$119	($259)	($50)	($309)	($259)	($50)	($309)		
12	Auto Repair & Maintenance	$2,020	$4	$2,024	$631	$1	$632	($1,636)	($4)	($1,639)	($1,636)	($4)	($1,639)		
13	Military Bases	$7	$8	$15	$2	$3	$5	($5)	($7)	($12)	($5)	($7)	($12)		
	Subtotals =	$8,794	$1,155	$9,949	$2,745	$361	$3,106	($7,121)	($935)	($8,056)	($7,121)	($935)	($8,056)		

C. Annual Labor Cost for Decanting Percolated "Free Liquids" From Transport Containers:

DISPOSABLE WIPES:		C1. Annual Labor Hours:			C2. Annual Labor Cost:		
		5	5	<Minutes/drum	$15.47	$15.47	<$/hour
Item	Sub-sector	SQGs	LQGs	Totals	SQGs	LQGs	Totals
1	Printing	74	10	84	$1,145	$150	$1,295
2	Chemical & Allied Products	14	6	20	$224	$93	$317
3	Plastics & Rubber	20	5	25	$306	$74	$381
4	Fabricated Metal Products	69	9	78	$1,070	$144	$1,213
5	Industrial Machinery & Eqpt	44	3	46	$678	$40	$719
6	Electronics & Computers	16	12	27	$246	$179	$425
7	Transportation Eqpt	13	7	20	$209	$103	$311
8	Furniture & Fixtures	23	2	25	$362	$24	$386
9	Auto Dealers (retail trade)	54	10	63	$830	$151	$981
10	Publishing (printed matter)	38	6	43	$581	$89	$670
11	Business services (copy shops)	10	2	12	$151	$29	$180
12	Auto Repair & Maintenance	184	0	185	$2,852	$6	$2,858
13	Military Bases	1	1	1	$9	$11	$21
	Subtotals =	560	71	631	$8,663	$1,094	$9,757

Estimated Cost to Industrial Laundries
for RCRA Manifest Transporting Decanted Spent Solvent "Free Liquids" From Transport Containers
To Offsite RCRA-Permitted Hazardous Waste Management Facilities

Nr. haz waste truck pickups per year	A. Free Liquids Truck Pickup Frequency at Laundry:						B. RCRA Manifest Cost/Year:			C. "Free Liquids" Truck Pickup Cost/Year: (if truck as RCRA haz waste to TSDRF)		
	A1. If SQG Laundry:			A2. If LQG Laundry:			SQG haz waste truck manifest cost/year	LQG haz waste truck manifest cost/year	Total $/year	200 miles	<Avg truck OW trip	
										$51.47	<Unit cost/drum	
	% affected laundries	Count of affected laundries	Avg nr. free liquids drums per pickup	Percent % affected laundries	Count of affected laundries	Avg nr. free liquids drums per pickup	$192	$199		if SQG	if LQG	Total
1	2%	6	3.1	60%	18	23	$1,167	$3,628	$4,795	$978	$21,765	$22,743
2	27%	103	4.5	40%	12	38	$39,674	$4,838	$44,512	$47,801	$47,021	$94,823
3	28%	109	6.6	0%	0	0	$63,012	$0	$63,012	$111,448	$0	$111,448
4	14%	55	9.2	0%	0	0	$42,008	$0	$42,008	$103,255	$0	$103,255
5	9%	36	11.2	0%	0	0	$35,007	$0	$35,007	$105,044	$0	$105,044
6	6%	24	13.6	0%	0	0	$28,006	$0	$28,006	$102,200	$0	$102,200
7	0%	0	0.0	0%	0	0	$0	$0	$0	$0	$0	$0
8	3%	12	18.6	0%	0	0	$18,670	$0	$18,670	$93,287	$0	$93,287
9	0%	0	0.0	0%	0	0	$0	$0	$0	$0	$0	$0
10	6%	24	23.3	0%	0	0	$46,676	$0	$46,676	$291,855	$0	$291,855
11	5%	18	26.0	0%	0	0	$38,508	$0	$38,508	$268,363	$0	$268,363
12	0%	0	0.0	0%	0	0	$0	$0	$0	$0	$0	$0
Totals =	100%	389	21,842	100%	30	1,336	$312,728	$8,466	$321,194	$1,124,232	$68,786	$1,193,018

Apportionment of Manifest & Trucking Costs According to Wipes Geneator Industry:

Item	Sub-Sector or Industry	Gallons "free liquids"		Manifest	Haz Waste Trucking
1	Printing	99,994	48.9%	$157,208	$583,919
2	Chemical & Allied Products	1,716	0.8%	$2,698	$10,022
3	Plastics & Rubber	1,996	1.0%	$3,138	$11,654
4	Fabricated Metal Products	6,201	3.0%	$9,749	$36,212
5	Industrial Machinery & Eqpt	3,597	1.8%	$5,654	$21,002
6	Electronics & Computers	2,393	1.2%	$3,762	$13,975
7	Transportation Eqpt	1,704	0.8%	$2,678	$9,948
8	Furniture & Fixtures	1,935	0.9%	$3,042	$11,301
9	Auto Dealers (retail trade)	5,075	2.5%	$7,978	$29,635
10	Publishing (printed matter)	51,658	25.3%	$81,215	$301,657
11	Business services (copy shops)	13,877	6.8%	$21,817	$81,036
12	Auto Repair & Maintenance	14,033	6.9%	$22,063	$81,948
13	Military Bases	122	0.1%	$191	$710
	Column totals =	204,301	100.0%	$321,194	$1,193,018
	Tons/year equivalent =	797			

Sample of 145 Industrial Laundry Facilities
Implied Spent Solvent "Free Liquid" Quantities
& Implied Laundry RCRA Status if "Free Liquids" Are Regulated as RCRA Hazardous Waste

Laundry facility survey count	Nr. wipes containers laundered per year	Nr. wipes containers w/free liquids per year if 3.5%	A. Annual Free Liquids: Gallons per year	A. Annual Free Liquids: Pounds per year	A. Annual Free Liquids: 55-gal drum eqvlnt per year	B. Monthly Free Liquids: Gallons per month	B. Monthly Free Liquids: Pounds per month	B. Monthly Free Liquids: 55-gal drum eqvlnt per month	C. Implied RCRA Subtitle C regulatory status	D. Implied Maximum Free Liquids Accumulation: Gallons	D. Implied Maximum Free Liquids Accumulation: 55-gal drum eqvlnts	D. Implied Maximum Free Liquids Accumulation: Pounds	D. Implied Maximum Free Liquids Accumulation: Tons	E. Implied nr. haz waste truck pickup manifests per year
1	66	2	5	40	0.1	0	3	0.0	CESQG	NA	NA	NA	NA	0
2	70	2	5	42	0.1	0	3	0.0	CESQG	NA	NA	NA	NA	0
3	93	3	7	56	0.1	1	5	0.0	CESQG	NA	NA	NA	NA	0
4	145	5	11	87	0.2	1	7	0.0	CESQG	NA	NA	NA	NA	0
5	184	7	14	110	0.3	1	9	0.0	CESQG	NA	NA	NA	NA	0
6	218	8	17	131	0.3	1	11	0.0	CESQG	NA	NA	NA	NA	0
7	274	10	21	165	0.4	2	14	0.0	CESQG	NA	NA	NA	NA	0
8	341	12	26	205	0.5	2	17	0.0	CESQG	NA	NA	NA	NA	0
9	394	14	30	236	0.6	3	20	0.0	CESQG	NA	NA	NA	NA	0
10	396	14	30	238	0.6	3	20	0.0	CESQG	NA	NA	NA	NA	0
11	433	15	33	260	0.6	3	22	0.1	CESQG	NA	NA	NA	NA	0
12	470	17	36	282	0.7	3	24	0.1	CESQG	NA	NA	NA	NA	0
13	474	17	36	285	0.7	3	24	0.1	CESQG	NA	NA	NA	NA	0
14	492	17	38	296	0.7	3	25	0.1	CESQG	NA	NA	NA	NA	0
15	513	18	40	308	0.7	3	26	0.1	CESQG	NA	NA	NA	NA	0
16	524	19	40	315	0.7	3	26	0.1	CESQG	NA	NA	NA	NA	0
17	629	22	48	377	0.9	4	31	0.1	CESQG	NA	NA	NA	NA	0
18	647	23	50	389	0.9	4	32	0.1	CESQG	NA	NA	NA	NA	0
19	712	25	55	427	1.0	5	36	0.1	CESQG	NA	NA	NA	NA	0
20	724	26	56	435	1.0	5	36	0.1	CESQG	NA	NA	NA	NA	0
21	728	26	56	437	1.0	5	36	0.1	CESQG	NA	NA	NA	NA	0
22	736	26	57	442	1.0	5	37	0.1	CESQG	NA	NA	NA	NA	0
23	743	26	57	446	1.0	5	37	0.1	CESQG	NA	NA	NA	NA	0
24	746	26	57	448	1.0	5	37	0.1	CESQG	NA	NA	NA	NA	0
25	768	27	59	461	1.1	5	38	0.1	CESQG	NA	NA	NA	NA	0
26	826	29	64	496	1.2	5	41	0.1	CESQG	NA	NA	NA	NA	0
27	930	33	72	558	1.3	6	47	0.1	CESQG	NA	NA	NA	NA	0
28	1,002	35	77	602	1.4	6	50	0.1	CESQG	NA	NA	NA	NA	0
29	1,012	36	78	608	1.4	6	51	0.1	CESQG	NA	NA	NA	NA	0
30	1,047	37	81	629	1.5	7	52	0.1	CESQG	NA	NA	NA	NA	0
31	1,098	39	85	659	1.5	7	55	0.1	CESQG	NA	NA	NA	NA	0
32	1,100	39	85	660	1.5	7	55	0.1	CESQG	NA	NA	NA	NA	0
33	1,104	39	85	663	1.5	7	55	0.1	CESQG	NA	NA	NA	NA	0
34	1,151	41	89	691	1.6	7	58	0.1	CESQG	NA	NA	NA	NA	0
35	1,154	41	89	693	1.6	7	58	0.1	CESQG	NA	NA	NA	NA	0
36	1,231	44	95	739	1.7	8	62	0.1	CESQG	NA	NA	NA	NA	0
37	1,238	44	95	743	1.7	8	62	0.1	CESQG	NA	NA	NA	NA	0
38	1,294	46	100	777	1.8	8	65	0.2	CESQG	NA	NA	NA	NA	0
39	1,344	48	103	807	1.9	9	67	0.2	CESQG	NA	NA	NA	NA	0
40	1,368	48	105	822	1.9	9	68	0.2	CESQG	NA	NA	NA	NA	0
41	1,381	49	106	829	1.9	9	69	0.2	CESQG	NA	NA	NA	NA	0
42	1,399	50	108	840	2.0	9	70	0.2	CESQG	NA	NA	NA	NA	0

Laundry facility survey count	Nr. wipes containers laundered per year	Nr. wipes containers w/free liquids per year if 3.5%	A. Annual Free Liquids:			B. Monthly Free Liquids:			C. Implied RCRA Subtitle C regulatory status	D. Implied Maximum Free Liquids Accumulation:				E. Implied nr. haz waste truck pickup manifests per year
			Gallons per year	Pounds per year	55-gal drum eqvlnt per year	Gallons per month	Pounds per month	55-gal drum eqvlnt per month		Gallons	55-gal drum eqvlnts	Pounds	Tons	
43	1,403	50	108	842	2.0	9	70	0.2	CESQG	NA	NA	NA	NA	0
44	1,410	50	109	847	2.0	9	71	0.2	CESQG	NA	NA	NA	NA	0
45	1,505	53	116	903	2.1	10	75	0.2	CESQG	NA	NA	NA	NA	0
46	1,569	56	121	942	2.2	10	78	0.2	CESQG	NA	NA	NA	NA	0
47	1,599	57	123	960	2.2	10	80	0.2	CESQG	NA	NA	NA	NA	0
48	1,644	58	127	987	2.3	11	82	0.2	CESQG	NA	NA	NA	NA	0
49	1,696	60	131	1,018	2.4	11	85	0.2	CESQG	NA	NA	NA	NA	0
50	1,768	63	136	1,062	2.5	11	88	0.2	CESQG	NA	NA	NA	NA	0
51	1,803	64	139	1,082	2.5	12	90	0.2	CESQG	NA	NA	NA	NA	0
52	1,922	68	148	1,154	2.7	12	96	0.2	CESQG	NA	NA	NA	NA	0
53	1,943	69	150	1,166	2.7	12	97	0.2	CESQG	NA	NA	NA	NA	0
54	1,993	71	153	1,197	2.8	13	100	0.2	CESQG	NA	NA	NA	NA	0
55	2,031	72	156	1,219	2.8	13	102	0.2	CESQG	NA	NA	NA	NA	0
56	2,164	77	167	1,299	3.0	14	108	0.3	CESQG	NA	NA	NA	NA	0
57	2,166	77	167	1,301	3.0	14	108	0.3	CESQG	NA	NA	NA	NA	0
58	2,537	90	195	1,523	3.6	16	127	0.3	CESQG	NA	NA	NA	NA	0
59	2,565	91	197	1,540	3.6	16	128	0.3	CESQG	NA	NA	NA	NA	0
60	2,640	93	203	1,585	3.7	17	132	0.3	CESQG	NA	NA	NA	NA	0
61	2,644	94	203	1,587	3.7	17	132	0.3	CESQG	NA	NA	NA	NA	0
62	2,732	97	210	1,640	3.8	18	137	0.3	CESQG	NA	NA	NA	NA	0
63	2,737	97	211	1,643	3.8	18	137	0.3	CESQG	NA	NA	NA	NA	0
64	2,866	101	221	1,721	4.0	18	143	0.3	CESQG	NA	NA	NA	NA	0
65	2,892	102	223	1,736	4.0	19	145	0.3	CESQG	NA	NA	NA	NA	0
66	3,105	110	239	1,864	4.3	20	155	0.4	CESQG	NA	NA	NA	NA	0
67	3,261	115	251	1,958	4.6	21	163	0.4	CESQG	NA	NA	NA	NA	0
68	3,512	124	270	2,108	4.9	23	176	0.4	CESQG	NA	NA	NA	NA	0
69	3,516	124	271	2,111	4.9	23	176	0.4	CESQG	NA	NA	NA	NA	0
70	3,648	129	281	2,190	5.1	23	182	0.4	CESQG	NA	NA	NA	NA	0
71	3,672	130	283	2,204	5.1	24	184	0.4	CESQG	NA	NA	NA	NA	0
72	3,747	133	288	2,249	5.2	24	187	0.4	CESQG	NA	NA	NA	NA	0
73	3,854	136	297	2,314	5.4	25	193	0.4	CESQG	NA	NA	NA	NA	0
74	3,963	140	305	2,379	5.5	25	198	0.5	CESQG	NA	NA	NA	NA	0
75	4,234	150	326	2,542	5.9	27	212	0.5	CESQG	NA	NA	NA	NA	0
76	4,324	153	333	2,596	6.1	28	216	0.5	CESQG	NA	NA	NA	NA	0
77	4,469	158	344	2,683	6.3	29	224	0.5	SQG	172	3	1,341	0.7	1
78	5,202	184	400	3,123	7.3	33	260	0.6	SQG	200	4	1,562	0.8	2
79	5,319	188	409	3,193	7.4	34	266	0.6	SQG	205	4	1,597	0.8	2
80	5,550	196	427	3,332	7.8	36	278	0.6	SQG	214	4	1,666	0.8	2
81	5,604	198	431	3,364	7.8	36	280	0.7	SQG	216	4	1,682	0.8	2
82	5,714	202	440	3,430	8.0	37	286	0.7	SQG	220	4	1,715	0.9	2
83	5,922	210	456	3,555	8.3	38	296	0.7	SQG	228	4	1,778	0.9	2
84	6,057	214	466	3,637	8.5	39	303	0.7	SQG	233	4	1,818	0.9	2
85	6,089	216	469	3,655	8.5	39	305	0.7	SQG	234	4	1,828	0.9	2
86	6,149	218	473	3,691	8.6	39	308	0.7	SQG	237	4	1,846	0.9	2
87	6,434	228	495	3,863	9.0	41	322	0.8	SQG	248	5	1,931	1.0	2
88	7,055	250	543	4,236	9.9	45	353	0.8	SQG	272	5	2,118	1.1	2
89	7,064	250	544	4,241	9.9	45	353	0.8	SQG	272	5	2,121	1.1	2

Laundry facility survey count	Nr. wipes containers laundered per year	Nr. wipes containers w/free liquids per year if 3.5%	A. Annual Free Liquids:			B. Monthly Free Liquids:			C. Implied RCRA Subtitle C regulatory status	D. Implied Maximum Free Liquids Accumulation:				E. Implied nr. haz waste truck pickup manifests per year
			Gallons per year	Pounds per year	55-gal drum eqvlnt per year	Gallons per month	Pounds per month	55-gal drum eqvlnt per month		Gallons	55-gal drum eqvlnts	Pounds	Tons	
90	7,201	255	554	4,323	10.1	46	360	0.8	SQG	277	5	2,161	1.1	2
91	7,206	255	555	4,326	10.1	46	361	0.8	SQG	277	5	2,163	1.1	2
92	7,374	261	568	4,427	10.3	47	369	0.9	SQG	284	5	2,214	1.1	2
93	7,390	262	569	4,436	10.3	47	370	0.9	SQG	284	5	2,218	1.1	2
94	7,866	278	605	4,722	11.0	50	394	0.9	SQG	303	6	2,361	1.2	2
95	8,335	295	642	5,004	11.7	53	417	1.0	SQG	321	6	2,502	1.3	3
96	8,421	298	648	5,056	11.8	54	421	1.0	SQG	324	6	2,528	1.3	3
97	8,422	298	648	5,056	11.8	54	421	1.0	SQG	324	6	2,528	1.3	3
98	8,463	300	651	5,081	11.8	54	423	1.0	SQG	326	6	2,540	1.3	3
99	8,679	307	668	5,210	12.1	56	434	1.0	SQG	334	6	2,605	1.3	3
100	8,708	308	670	5,228	12.2	56	436	1.0	SQG	335	6	2,614	1.3	3
101	8,798	311	677	5,282	12.3	56	440	1.0	SQG	339	6	2,641	1.3	3
102	9,104	322	701	5,465	12.7	58	455	1.1	SQG	350	6	2,733	1.4	3
103	9,298	329	716	5,582	13.0	60	465	1.1	SQG	358	7	2,791	1.4	3
104	9,437	334	726	5,665	13.2	61	472	1.1	SQG	363	7	2,833	1.4	3
105	9,714	344	748	5,832	13.6	62	486	1.1	SQG	374	7	2,916	1.5	3
106	9,752	345	751	5,855	13.6	63	488	1.1	SQG	375	7	2,927	1.5	3
107	9,887	350	761	5,936	13.8	63	495	1.2	SQG	380	7	2,968	1.5	3
108	9,934	352	765	5,964	13.9	64	497	1.2	SQG	382	7	2,982	1.5	3
109	10,139	359	780	6,087	14.2	65	507	1.2	SQG	390	7	3,044	1.5	3
110	10,143	359	781	6,089	14.2	65	507	1.2	SQG	390	7	3,045	1.5	3
111	11,176	396	860	6,710	15.6	72	559	1.3	SQG	430	8	3,355	1.7	3
112	11,317	401	871	6,794	15.8	73	566	1.3	SQG	436	8	3,397	1.7	3
113	11,678	413	899	7,011	16.3	75	584	1.4	SQG	449	8	3,506	1.8	4
114	12,113	429	932	7,272	17.0	78	606	1.4	SQG	466	8	3,636	1.8	4
115	12,351	437	951	7,415	17.3	79	618	1.4	SQG	475	9	3,707	1.9	4
116	12,716	450	979	7,634	17.8	82	636	1.5	SQG	489	9	3,817	1.9	4
117	12,872	456	991	7,728	18.0	83	644	1.5	SQG	495	9	3,864	1.9	4
118	13,165	466	1,013	7,904	18.4	84	659	1.5	SQG	507	9	3,952	2.0	4
119	14,229	504	1,095	8,542	19.9	91	712	1.7	SQG	548	10	4,271	2.1	4
120	14,277	505	1,099	8,571	20.0	92	714	1.7	SQG	549	10	4,285	2.1	4
121	14,537	514	1,119	8,727	20.3	93	727	1.7	SQG	559	10	4,363	2.2	4
122	15,072	533	1,160	9,048	21.1	97	754	1.8	SQG	580	11	4,524	2.3	5
123	15,497	548	1,193	9,304	21.7	99	775	1.8	SQG	596	11	4,652	2.3	5
124	15,980	566	1,230	9,593	22.4	102	799	1.9	SQG	615	11	4,797	2.4	5
125	16,278	576	1,253	9,772	22.8	104	814	1.9	SQG	626	11	4,886	2.4	5
126	16,431	582	1,265	9,864	23.0	105	822	1.9	SQG	632	11	4,932	2.5	5
127	16,727	592	1,287	10,042	23.4	107	837	2.0	SQG	644	12	5,021	2.5	5
128	18,487	654	1,423	11,099	25.9	119	925	2.2	SQG	711	13	5,549	2.8	6
129	18,885	668	1,454	11,338	26.4	121	945	2.2	SQG	727	13	5,669	2.8	6
130	19,895	704	1,531	11,944	27.8	128	995	2.3	SQG	766	14	5,972	3.0	6
131	20,555	728	1,582	12,340	28.8	132	1,028	2.4	SQG	791	14	6,170	3.1	6
132	26,637	943	2,050	15,991	37.3	171	1,333	3.1	SQG	1,025	19	7,996	4.0	8
133	26,640	943	2,050	15,993	37.3	171	1,333	3.1	SQG	1,025	19	7,997	4.0	8
134	32,239	1,141	2,481	19,354	45.1	207	1,613	3.8	SQG	1,241	23	9,677	4.8	10
135	32,697	1,157	2,517	19,630	45.8	210	1,636	3.8	SQG	1,258	23	9,815	4.9	10
136	34,021	1,204	2,619	20,425	47.6	218	1,702	4.0	SQG	1,309	24	10,212	5.1	10

Laundry facility survey count	Nr. wipes containers laundered per year	Nr. wipes containers w/free liquids per year if 3.5%	A. Annual Free Liquids: Gallons per year	A. Annual Free Liquids: Pounds per year	A. Annual Free Liquids: 55-gal drum eqvlnt per year	B. Monthly Free Liquids: Gallons per month	B. Monthly Free Liquids: Pounds per month	B. Monthly Free Liquids: 55-gal drum eqvlnt per month	C. Implied RCRA Subtitle C regulatory status	D. Implied Maximum Free Liquids Accumulation: Gallons	D. Implied Maximum Free Liquids Accumulation: 55-gal drum eqvlnts	D. Implied Maximum Free Liquids Accumulation: Pounds	D. Implied Maximum Free Liquids Accumulation: Tons	E. Implied nr. haz waste truck pickup manifests per year
137	34,385	1,217	2,647	20,643	48.1	221	1,720	4.0	SQG	1,323	24	10,321	5.2	10
138	35,895	1,270	2,763	21,549	50.2	230	1,796	4.2	SQG	1,381	25	10,775	5.4	11
139	37,380	1,323	2,877	22,441	52.3	240	1,870	4.4	SQG	1,439	26	11,220	5.6	11
140	38,188	1,352	2,939	22,926	53.4	245	1,911	4.5	SQG	1,470	27	11,463	5.7	11
141	54,993	1,946	4,233	33,015	77.0	353	2,751	6.4	LQG	1,058	19	8,254	4.1	1
142	67,550	2,391	5,199	40,553	94.5	433	3,379	7.9	LQG	1,300	24	10,138	5.1	1
143	76,336	2,702	5,875	45,828	106.8	490	3,819	8.9	LQG	1,469	27	11,457	5.7	1
144	97,544	3,452	7,508	58,560	136.5	626	4,880	11.4	LQG	1,877	34	14,640	7.3	2
145	117,286	4,151	9,027	70,412	164.1	752	5,868	13.7	LQG	2,257	41	17,603	8.8	2
Totals =	1,407,193	49,805	108,308	844,802	1,969	9,026	70,400	164						
		Reference benchmark =	204,301											
		Sample subtotal as % of benchmark =	53%											

Profile of Industrial Laundries
According to Monthly Quantity of "*Free Liquids*" Which May be Recovered
from Spent Reusable Wipes Transport Containers:
Based on Business Operating Characteristics for a Sample of 145 Industrial Laundries in Prior Table

Source: USEPA Office of Water,
1994 Section 308 National Survey Sample, EPA-821-R-00-004, March 2000

If Exected "Free Liquid" Monthly Quantity = SQG			If Expected "Free Liquid" Monthly Quantity = LQG		
Annual Number of RCRA Manifests & Truck Pickups	If SQG	Count of Sample Facilities	Annual Number of RCRA Manifests & Truck Pickups	If LQG	Count of Sample Facilities
1	2%	1	1	60%	3
2	27%	17	2	40%	2
3	28%	18	3	0%	0
4	14%	9	4	0%	0
5	9%	6	5	0%	0
6	6%	4	6	0%	0
7	0%	0	7	0%	0
8	3%	2	8	0%	0
9	0%	0	9	0%	0
10	6%	4	10	0%	0
11	5%	3	11	0%	0
>11	0%	0	>11	0%	0
Checksum =	100%	64	Checksum =	100%	5

Note: The remainder 76 facilities in the 145 sample are estimated to likely be classified as RCRA CESQG monthly quantity facilities.

Estimate of Average Annual Cost for Compliance
With the 40 CFR 261.2(f) RCRA Exclusion Documentation Requirement

Item	Economic Sub-Sector or Industry	A Count of Potentially Affected (Eligible) Facilities Total facilities	B Count of Potentially Affected (Eligible) Facilities Reusable wipes facilities	C Count of Potentially Affected (Eligible) Facilities Disposable wipes facilities	D Assumed % of facilities which may be subject to RCRA inspections**	E (B x D x $uc) Average Annual Cost*** Reusable wipes facilities	F (C x D x $uc) Average Annual Cost*** Disposable wipes facilities	E + F Average Annual Cost*** Total facilities (Reusables + Disposables)	G Average Annual Cost*** Cost to EPA for inspection personnel
1	Printing	31,177	28,989	2,188	0.06%	$1,826	$138	$1,964	$4,489
2	Chemical & Allied Products	1,907	1,735	171	15.0%	$27,334	$2,698	$30,033	$68,646
3	Plastics & Rubber	2,438	2,216	222	0.06%	$140	$14	$154	$351
4	Fabricated Metal Products	8,552	7,769	783	0.06%	$489	$49	$539	$1,232
5	Industrial Machinery & Eqpt	4,122	3,742	380	0.06%	$236	$24	$260	$594
6	Electronics & Computers	956	872	84	0.06%	$55	$5	$60	$138
7	Transportation Eqpt	1,955	1,780	175	0.06%	$112	$11	$123	$281
8	Furniture & Fixtures	2,796	2,539	257	0.06%	$160	$16	$176	$403
9	Auto Dealers (retail trade)	7,001	6,362	639	0.06%	$401	$40	$441	$1,008
10	Publishing (printed matter)	17,695	16,453	1,242	0.06%	$1,037	$78	$1,115	$2,548
11	Business services (copy shops)	4,803	4,466	337	0.06%	$281	$21	$303	$692
12	Auto Repair & Maintenance	23,537	21,360	2,177	0.06%	$1,346	$137	$1,483	$3,389
13	Military Bases	86	79	7	0.06%	$5	$0	$5	$12
	Sub-total spent wipes generators =	107,025	98,362	8,663		$33,422	$3,233	$36,655	$83,783
14	Industrial Laundries	881	881	0	0.4%	$370	$0	$370	$846
15	Solid Waste Management Facilities	7,238	0	7,238	20%	$0	$151,988	$151,988	$347,400
	Column totals ("most-likely") =	115,144	99,243	15,900		$33,792	$155,221	**$189,013**	**$432,029**

Explanatory Notes:

(a) * $uc= unit cost: Average of $105 per facility unit cost assigned (year 2000$), based on Office of Solid Waste, Economics, Methods & Risk Analysis Division (EMRAD) "*Unit Cost Compendium*", 30 Sept 2000, page 1 (cost item nr. 4 - waste stream notification one-time cost). This unit cost represents labor cost for facility personnel either:

- To retrieve existing business records to serve as documentation, or
- To generate and retrieve other type of documentation, for presentation to inspector.

EPA cost estimated at $240 per RCRA-authority inspection (OSW-EMRAD judgement), representing $80/hour average loaded wage rate for three hours per site (travel & inspection).

(b) ** Inspection: Assumed inspection fractions (percentages) applied in this table based on annual inspection statistics provided in USEPA Office of Enforcement & Compliance Assurance, "Annual Report on Enforcement & Compliance Assurance Accomplishments in 1999", EPA-300-R-00-005, July 2000, according to the following sector-based computations:

- Item 2 chemical & allied products based on OECA report data page A-8 for "Industrial Organics & Chemical Preparations":
  [(3,000 inspections FY99) x (17% RCRA inspections from p.9)] / (3,387 total OECA subject facilities) = 15%
- Item 15 based on OECA report data page A-5 for "Dry cleaning":
  [(111 inspections FY95) x (78% RCRA inspections)] / (22,330 dry cleaning plants 1997 Economic Census) = 0.4%
- Item 16: solid waste facilities based on OECA report data page 10:
  (3,100 RCRA TSDF universe FY99) x (63% inspected FY99) = 1,953 inspections.
  (1,953 inspections) / (9,650 solid waste management facilities from 1997 Economic Census) = 20%
- All other items based on OECA report data page A-1 for "Automotive Service & Repair Sector"):
  [(1,749 inspections FY99) x (17% RCRA inspections from p. 9)] / (500,000 service shops) = 0.06%

c) *** Annual cost: The paperwork burden cost estimated in this table represents a hypothetical average ***annual cost***, rather than a ***one-time cost*** (e.g. cost which only occurs in the first year after implementation of the rule). Annual cost represents the regulatory mechanism for documentation in 40 CFR 261.2(f), which specifies that documentation must be provided by:
"Respondents [i.e. owners or operators of facilities] in actions to enforce regulations implementing Subtitle C of RCRA who raise a claim that a certain material is not a solid waste, or is conditionally exempt from regulation..."

AVOIDED RCRA ADMINISTRATIVE COSTS TO WIPES USING SQGs WHICH MAY BECOME CESQGs:										
DISPOSABLE INDUSTRIAL WIPES:		A. Number of solvent wipes facilities:			B. Number of SQGs which change status			D. Avoided annual RCRA admin cost:		
					1.7%	0%		$5,435	<$/facility/yr	
Item	Sub-sector	SQGs	LQGs	Totals	SQGs	LQGs	Totals	SQGs	LQGs	Totals
1	Printing	2,158	NA	2,158	37	NA	37	$199,390	NA	$199,390
2	Chemical & Allied Products	155	NA	155	3	NA	3	$14,354	NA	$14,354
3	Plastics & Rubber	209	NA	209	4	NA	4	$19,314	NA	$19,314
4	Fabricated Metal Products	758	NA	758	13	NA	13	$70,041	NA	$70,041
5	Industrial Machinery & Eqpt	374	NA	374	6	NA	6	$34,567	NA	$34,567
6	Electronics & Computers	72	NA	72	1	NA	1	$6,613	NA	$6,613
7	Transportation Eqpt	156	NA	156	3	NA	3	$14,402	NA	$14,402
8	Furniture & Fixtures	253	NA	253	4	NA	4	$23,404	NA	$23,404
9	Auto Dealers (retail trade)	611	NA	611	10	NA	10	$56,497	NA	$56,497
10	Publishing (printed matter)	1,222	NA	1,222	21	NA	21	$112,914	NA	$112,914
11	Business services (copy shops)	330	NA	330	6	NA	6	$30,525	NA	$30,525
12	Auto Repair & Maintenance	2,176	NA	2,176	37	NA	37	$201,061	NA	$201,061
13	Military Bases	6	NA	6	0	NA	0	$529	NA	$529
	Subtotals =	8,481	NA	8,481	144	NA	144	$783,612	NA	$783,612

State Hazardous Waste Taxes & Fees												
		A. Annual Haz Waste Quantities:				B. State Haz Waste Taxes/Fees:				C. State Non-Haz Waste Taxes/Fees:		
				Haz waste generation: (source: 1999 BRS data)				Haz waste generator fee:				
Item	State	Land disposal (1993 NHWCS tons)	Incineration (1993 NHWCS tons)	(1999 tons)	(Count LQGs)	Land disposal ($/ ton)	Combustion ($/ton)	($/ton)	($/year)	Land disposal ($/ ton)	Incineration ($/ton)	Solid waste generator fee ($/year)
1	AL	117,282	54,629	491,178	274	$51.00	$0	$0	$0	$21.00	$0	$0
2	AK	0	0	1,335	42	$0	$0	$0	$0	$0	$0	$0
3	AZ	0	0	39,016	193	$40.00	$2.00	$10.00	$0	$0	$0	$0
4	AR	640,619	92,320	970,995	241	$11.00	$3,000	$0	$550	$0	$0	$0
5	CA	92,643	37,090	427,302	1,850	$45.13	$5.58	$0	$7,000	$18.22	$5.58	$0
6	CO	57,412	0	49,190	163	$4.40	$4.40	$0	$0	$2.00	$2.00	$0
7	CT	0	5,788	92,201	391	$15.00	$15.00	$9.60	$0	$0.50	$0	$0
8	DE	0	0	26,071	76	$21.00	$4.00	$0	$0	$0	$0	$0
9	DC	0	0	1,167	30	$0	$0	$0	$0	$0	$0	$0
10	FL	0	0	272,387	366	$0	$0	$0	$0	$0	$0	$0
11	GA	0	32,080	209,206	384	$20.00	$20.00	$0	$0	$0	$0	$0
12	HW	0	0	1,456	37	$0	$0	$0	$0	$0	$0	$0
13	ID	571,197	0	851,764	38	$30.00	$30.00	$0	$0	$0	$0	$0
14	IL	373,006	29,866	2,907,327	1,006	$61.00	$20.00	$0	$250	$0.95	$0	$0
15	IN	591,942	212,129	984,895	586	$11.50	$11.50	$0	$1,200	$0	$0	$600
16	IA	0	0	46,828	188	$50.00	$10.00	$10.00	$0	$0	$0	$0
17	KS	1,338,813	89,653	1,594,119	224	$10.00	$20.00	$0	$1,650	$0	$0	$0
18	KY	0	115,092	214,842	340	$24.10	$12.05	$10.50	$300	$0	$0	$0
19	LA	3,684,421	188,151	4,351,245	440	$85.00	$0	$0	$384	$0	$0	$0
20	ME	0	0	4,374	102	$40.00	$30.00	$0	$0	$0	$0	$0
21	MD	0	0	80,256	289	$0	$0	$0	$0	$0	$0	$0
22	MA	0	0	1,191,465	448	$0	$0	$0	$0	$1.00	$0	$0
23	MI	213,989	143,083	1,385,375	823	$10.00	$0	$0	$0	$0	$0	$0
24	MN	0	14,162	56,573	262	$77.11	$19.28	$0	$50	$0.45	$0	$0
25	MS	1,497,900	4,658	1,598,642	136	$10.00	$2.00	$0	$1,260	$1.00	$1.00	$0
26	MO	7,090	416,686	158,682	312	$25.00	$1.00	$1.00	$0	$0	$0	$0
27	MT	0	0	23,986	30	$0	$0	$0	$800	$0	$0	$0
28	NE	0	0	43,224	85	$22.40	$1.92	$0	$0	$0	$0	$0
29	NV	71,281	0	11,473	102	$40.20	$17.75	$0	$0	$0	$0	$0
30	NH	0	0	11,082	168	$60.00	$60.00	$0	$600	$1.00	$0	$0
31	NJ	46,780	22,797	650,534	1,071	$0	$0	$0	$1,200	$0	$0	$0
32	NM	0	0	238,558	41	$0	$0	$20.00	$0	$0	$0	$0
33	NY	107,726	88,575	548,928	2,647	$27.00	$9.00	$0	$6,350	$0	$0	$0
34	NC	0	0	74,757	508	$1.75	$1.75	$0	$2,500	$0	$0	$0
35	ND	0	0	2,675	16	$0	$0	$0	$0	$0	$0	$0
36	OH	830,429	162,828	1,644,029	1,181	$9.00	$2.00	$0	$500	$0	$0	$0
37	OK	88,269	0	417,460	147	$9.00	$9.00	$0	$250	$0	$0	$0
38	OR	107,641	0	81,270	208	$135.00	$90.00	$0	$525	$0	$0	$0
39	PA	38,971	94,487	417,477	965	$12.00	$5.00	$0	$0	$3.00	$0	$0
40	RI	0	0	37,622	145	$0	$0	$0	$0	$0	$0	$0
41	SC	73,799	67,398	14,761	347	$34.00	$10.00	$0	$0	$13.70	$10.00	$0
42	SD	0	0	1,074	21	$50.00	$50.00	$0	$0	$0	$0	$0
43	TN	11,021	190,970	2,218,753	396	$5.00	$2.50	$0	$900	$0	$0	$0
44	TX	8,061,824	1,894,789	14,923,520	907	$30.00	$16.00	$0	$2,500	$1.45	$0	$500

		A. Annual Haz Waste Quantities:				B. State Haz Waste Taxes/Fees:				C. State Non-Haz Waste Taxes/Fees:		
				Haz waste generation: (source: 1999 BRS data)				Haz waste generator fee:				
Item	State	Land disposal (1993 NHWCS tons)	Incineration (1993 NHWCS tons)	(1999 tons)	(Count LQGs)	Land disposal ($/ ton)	Combustion ($/ton)	($/ton)	($/year)	Land disposal ($/ ton)	Incineration ($/ton)	Solid waste generator fee ($/year)
45	UT	43,338	3,246	80,427	91	$28.00	$9.00	$0	$0	$2.50	$2.50	$0
46	VT	0	0	5,275	65	$112.00	$56.00	$0	$0	$6.00	$0	$0
47	VA	0	40,368	121,787	332	$0	$0	$0	$0	$0	$0	$0
48	WA	0	0	91,245	545	$0	$0	$12.90	$0	$8.03	$8.03	$0
49	WV	28,627	18,877	92,503	139	$35.29	$26.47	$0	$0	$0	$0	$0
50	WI	0	9,496	159,174	540	$0.15	$0.15	$12.83	$125	$0.30	$0	$0
51	WY	0	0	4,746	22	$0	$0	$0	$0	$0	$0	$0
Column totals =		18,696,022	4,029,218	39,924,231	19,960							
					Count of states with tax rate > $0 =	37	34	8	20	16	6	2
					Mean tax rate ($/ton) =	$25	$70	$1.70	$567	$1.59	$0.57	$22
					Tons-weighted mean tax rate ($/ton) =	$37	$79	$0.30	**$1,893**	$1.02	$0.22	**$40**
					Median tax rate ($/ton) =	$12	$4	$0.00	$0	$0.00	$0.00	$0
					Max tax rate ($/ton) =	$135	$3,000	$20	$7,000	$21.00	$10.00	$600

Explanatory Notes:

! State solid & hazardous waste fees/taxes data sources:

--- Hilary Sigman, Journal of Environmental Economics & Management, Vol.30, pp.199-217, 1996 (based on chlorinated solvent taxes).
--- J. Andrew Hoerner, State Tax Notes (journal), Vol.14, No.16, 20 April 1998, Tables 4 & 5.
--- "State Taxes and Fees" (hazardous waste), HTRW Center of Expertise Information - TSDF, US Army Corps of Engineers:
--- http://www.environmental.usace.army.mil/library/pubs/tsdf/sec8-2/sec8-2.html

! Limitations of This Data Table:

--- This table does not differentiate & include special categories of waste taxes (batteries, tires, used oil, acutely toxic, out-of-state wastes).
--- This table does not include indirect taxes and other tax provisions related to solid waste (e.g. bottle deposit).
--- Municipalities and counties in some states have waste management fees, which are not included in this table.

! NHWCS = EPA-OSW "National Hazardous Waste Constituent Survey" database (1993 base).

! Land disposal = represents M11x or M13x BRS system type codes managed (but not necessarily generated) in state.

! Incineration = represents M04x or M05x or M06x BRS system type codes managed (but not necessarily generated) in state.

! BRS = USEPA Office of Solid Waste "Biennial Reporting System" for RCRA hazardous waste handlers.

Estimate of Potential Cost Savings to Industrial Wipes Users/Handlers for State Waste Fees Avoided

A. State Annual Fees for Waste Generators:

	Tons-weighted national average annual fee per generator facility>				$40	$40		$1,893	$1,893	
		2001 Count of Facilities (SQGs+LQGs)			Annual Cost as Solid Waste Generators:			Annual Cost as Haz Waste Generators:		
Item	Industry/Sub-Sector	Reusables	Disposables	Totals	Reusables	Disposables	Totals	Reusables	Disposables	Totals
1	Printing	28,989	2,188	31,177	$1,169,287	$88,257	$1,257,544	$54,867,692	$4,141,400	$59,009,092
2	Chemical & Allied Products	1,735	171	1,907	$70,003	$6,911	$76,913	$3,284,803	$324,282	$3,609,084
3	Plastics & Rubber	2,216	222	2,438	$89,404	$8,937	$98,341	$4,195,189	$419,379	$4,614,568
4	Fabricated Metal Products	7,769	783	8,552	$313,363	$31,592	$344,955	$14,704,272	$1,482,403	$16,186,675
5	Industrial Machinery & Eqpt	3,742	380	4,122	$150,947	$15,312	$166,259	$7,083,063	$718,479	$7,801,542
6	Electronics & Computers	872	84	956	$35,153	$3,403	$38,556	$1,649,510	$159,676	$1,809,186
7	Transportation Eqpt	1,780	175	1,955	$71,793	$7,051	$78,845	$3,368,840	$330,878	$3,699,717
8	Furniture & Fixtures	2,539	257	2,796	$102,403	$10,382	$112,785	$4,805,177	$487,173	$5,292,350
9	Auto Dealers (retail trade)	6,362	639	7,001	$256,633	$25,774	$282,407	$12,042,256	$1,209,438	$13,251,694
10	Publishing (printed matter)	16,453	1,242	17,695	$663,659	$50,093	$713,752	$31,141,591	$2,350,560	$33,492,151
11	Business services (copy shops)	4,466	337	4,803	$180,123	$13,596	$193,719	$8,452,099	$637,962	$9,090,062
12	Auto Repair & Maintenance	21,360	2,177	23,537	$861,550	$87,819	$949,369	$40,427,430	$4,120,832	$44,548,262
13	Military Bases	79	7	86	$3,175	$300	$3,475	$148,998	$14,061	$163,058
	Total generators =	98,362	8,663	107,025	$3,967,493	$349,427	$4,316,919	$186,170,919	$16,396,521	$202,567,439
14	Industrial laundries	881	0	881	$35,546	$0	$35,546	$1,667,954	$0	$1,667,954
15	Solid waste management	0	7,238	7,238	$0	$291,929	$291,929	$0	$13,698,517	$13,698,517
	Grand total =	99,243	15,900	115,144	**$4,003,039**	$641,356	$4,644,395	$187,838,873	**$30,095,038**	$217,933,910
					B. Fees for NonHW Landfill:			**C. Fees for NonHW Combustion:**		
	Tons-weighted national average fee per ton >					$1.02	89%	$0.22	$0.22	11%
		2001 Spent Wipes Tons (SQGs+LQGs)			Annual Cost as Solid Waste Generators:			20%		
Item	Industry/Sub-Sector	Reusables	Disposables	Totals	Reusables	Disposables	Totals	Reusables	Disposables	Totals
1	Printing	36,362	521	36,883	$0	$474	$474	$1,613	$12	$1,625
2	Chemical & Allied Products	3,745	255	4,000	$0	$232	$232	$166	$6	$172
3	Plastics & Rubber	4,354	306	4,661	$0	$279	$279	$193	$7	$200
4	Fabricated Metal Products	13,530	977	14,506	$0	$888	$888	$600	$23	$623
5	Industrial Machinery & Eqpt	7,847	579	8,426	$0	$526	$526	$348	$14	$362
6	Electronics & Computers	5,221	342	5,564	$0	$311	$311	$232	$8	$240
7	Transportation Eqpt	3,717	251	3,968	$0	$228	$228	$165	$6	$171
8	Furniture & Fixtures	4,222	311	4,533	$0	$283	$283	$187	$7	$195
9	Auto Dealers (retail trade)	11,072	790	11,863	$0	$719	$719	$491	$19	$510
10	Publishing (printed matter)	18,785	270	19,054	$0	$245	$245	$833	$6	$840
11	Business services (copy shops)	5,046	72	5,119	$0	$66	$66	$224	$2	$226
12	Auto Repair & Maintenance	30,618	2,301	32,919	$0	$2,093	$2,093	$1,358	$54	$1,412
13	Military Bases	265	17	282	$0	$15	$15	$12	$0	$12
	Total generators =	144,784	6,992	151,777	$0	$6,360	$6,360	$6,423	$164	$6,587
14	Industrial laundries	144,784	0	144,784	$0	$0	$0	$6,423	$0	$6,423
15	Solid waste management	0	6,992	6,992	$0	$6,360	$6,360	$0	$164	$164
	Grand total =	144,784	13,985	158,769	$0	$12,720	$12,720	$6,423	$328	$6,751

Cachet Benefit to Industrial Laundries from Avoided Waste "*Stigma*"
Associated with Reusable Industrial Wipes

In a 23 May 2001 meeting between OSW and reusable wipes suppliers, at least one supplier indicated that reusable wipes suppliers (industrial laundries) want to avoid the market product "*stigma*" associated with regulatory classification of spent reusable industrial wipes as a form of "waste". USEPA Office of Solid Waste estimates that about 50% of states currently exclude reusable wipes from solid waste regulatory classification, and the other 50% of states currently exclude reusable wipes from hazardous waste regulatory classification, but not from solid waste classification (i.e. 0% of spent solvent reusable industrial wipes are currently regulated as "*hazardous wastes*"). Consequently, under the proposed exclusion of spent solvent reusable wipes from "*solid waste*" designation, the market for reusable wipes in states which currently only exclude reusable wipes from "*hazardous waste*" classification, could realize *cachet value*[12] from avoided product stigma of classification as a solid waste material. The potential magnitude of this benefit may be estimated as follows:

!	Affected wipes sub-market:	Assuming that 50% of the 56 RCRA-authorized states/tribes/territories currently exclude spent solvent reusable industrial wipes from "hazardous waste" but not from "solid waste" regulatory classification, represents 50% of the potentially affected spent solvent reusable wipes sub-market (50% x 2.55 billion wipes/year = 1.27 billion wipes/year);
!	Affected sub-market revenues:	Assuming that this potentially affected reusable wipes quantity represents $69 million/year in industrial laundry revenues (1.27 billion wipes/year x $0.054 laundry revenue/wipe); and
!	Stigma product value loss:	Assuming environmental-induced stigma may result in 5% to 10% average loss[13] in product value (i.e. loss in sales revenues);

the cachet benefit of the proposed solid waste exclusion for spent reusable wipes, represents **$3.4 to $6.9 million/year** product catchet value (sales revenue) benefit to industrial laundries from avoided stigma as a "waste" [i.e. ($69 million/year) x (5% to 10%)]. At 14.4% average industrial laundry profit rate, this benefit represents $0.5 to $1.0 million/year cachet value in avoided lost profit for industrial laundries from avoided stigma [i.e. ($3.4 to $6.9 million/year) x (14.4%)].

[12] "*Cachet*" = a seal or mark used especially to designate official approval; an indication of approval carrying great prestige; a characteristic feature or quality conferring prestige; cachet in its positive set of connotations is the opposite of "*stigma*" = a scar left by a hot iron; a mark of shame or discredit; stain; an identifying mark or characteristic; a specific diagnostic sign of disease. (source: Merrian Webster's Collegiate Dictionary, 10th edition, 1996). *Stigma* may reduce the economic value of a place or product to levels below what one would expect when one takes into account the health/safety risk associated with it. There are also mechanisms which may contribute to the social amplification of *stigma* such as mass media reports, litigation, and increased regulation of an industry (Flynn, et al., 2001, p.335).

[13] This 5% to 10% average value loss is based on two cases of empirical findings on environmental-induced product and property loss, respectively, summarized in James Flynn, Paul Slovic, & Howard Kunreuther, Risk, Media, and Stigma: Understanding Public Challenges to Modern Science and Technology, Earthscan Publications Ltd., London, 2001, 416 pp. Economic loss from hazardous chemical/material contamination stigma is basically defined and measured as the difference in the market value of non-contaminated product or property, compared to the market value of comparable but contaminated product or property which has been fully remediated (i.e. cleaned-up or decontaminated). Stigma encompasses an intangible concept of perceived risk that lies beyond remediation costs and includes further discounts to compensate investors, purchasers, and/or lenders with the perceived risks associated with formerly contaminated products or property. The inference is that stigma may continue to affect product or property values without real or observable contamination (ibid, p.189). The 5% loss is the long-term stigma effect on sales marketshare for a household product which became contaminated with a hazardous chemical (see case on p.205, footnote 7), and the 10% loss is the aggregate long-term environmental contamination stigma effect on US property values (see 1991 Patchin reference on p.189). Flynn et al. state that "*[C]hemical risks in general carry a well-described burden of stigma in our society. And in a very interesting observation, ... the rise of scientific risk assessment approaches themselves in the last quarter-century accentuate this stigma*." (p.266).

Avoided RCRA Generator Administrative (Paperwork Burden) Costs to Industrial Laundries Under Alternative Baseline (i.e. If Baseline Defined as Hypothetical Full Compliance With RCRA Subtitle C Regulations)

A. Estimated Number of Affected Industrial Laundries:	Facilities	%
Total number of industrial wipes laundries in states adopting rule =	881	100%
Number of laundries which may become RCRA LQGs =	30	3%
Number of laundries which may become RCRA SQGs =	389	44%
Total number laundries which may become RCRA generators (SQGs+LQGs) =	419	48%

B. Unit Costs (Average Per Facility in 2001$) for RCRA Generator Administrative Requirements:

Item	RCRA Generator Administrative Requirement	Code of Federal Regulations citations	One-time cost per facility	Annual cost per facility	Annualized cost/facility
1	Obtain EPA ID number (EPA Form 8700-12)	40 CFR 262.12	$206	$104	$135
2	RCRA waste determination (apply knowledge cost represented in this table, not testing)	40 CFR 262.11 & 268.7	$11	$0	$1
3	RCRA preparedness & prevention	40 CFR 265 Subpart C			
3a	Must have internal emergency communications or alarm system, with immediate access	40 CFR 265.32(a) & 265.34	Assume already implemented at laundries		
3b	Must have phone or radio for emergency local fire/police contact	40 CFR 265.32(b)	Assume already implemented at laundries		
3c	Must have portable fire extinguishers & special extinguishing eqpmt	40 CFR 265.32(c)	Assume already implemented at laundries		
3d	Must have spill control equipment	40 CFR 265.32(c)	Assume already implemented at laundries		
3e	Must have decontamination equipment	40 CFR 265.32(c)	Assume already implemented at laundries		
3f	Must have adequate water volume & pressure to supply fire protection systems	40 CFR 265.32(d)	Assume already implemented at laundries		
3g	Must test/maintain emergency communications equipment	40 CFR 265.33	Assume already implemented at laundries		
3h	Provide unobstructed aisle space for emergency access to any area of facility	40 CFR 265.35	Assume already implemented at laundries		
3i	Arrange to familiarize State & local police, fire, & hospitals with facility & haz waste	40 CFR 265.37	$40	$0	$5.3
3j	Document whether State or local authorities decline to participate	40 CFR 265.37(4)(b)	$4	$0	$0.5
4	RCRA contingency plan & emergency procedures	40 CFR 265 Subpart D			
	Prepare contingency plan	40 CFR 265.51 & 265.52	$227	$0	$30
	Maintain copy of contingency plan at facility	40 CFR 265.53(a)	$2	$0	$0.2
	Submit copies of contingency plan to all state & local emergency centers	40 CFR 265.53(b)	$9	$0	$1.1
	Amend contingency plan as appropriate	40 CFR 265.54	$0	$40	$40
	Designation & provision of on-call employee as emergency coordinator	40 CFR 265.55	$0	$21	$21
	Implement 14** emergency procedures during imminent or actual emergency	40 CFR 265.56	$0	$310	$310
5	Personnel training (classroom or on-the-job using haz waste professional)	40 CFR 265.16	$2,485	$2,020	$2,350
6	Prepare RCRA manifests (EPA Form 8700-22) for waste transport	40 CFR 262 Subpart B	Estimated in another table		
7	Mark each package & container of haz waste for transport	40 CFR 262.32	$0	$11	$11
8	Offer USDOT placard to waste transporter	40 CFR 262.33	Estimated in another table		
9	Prepare & submit RCRA Biennial Report	40 CFR 262.41	$0	$801	$801
10	Exception reporting:	40 CFR 262.42			
10a*	Contact TSDF if do not receive manifest receipt in 35 days	40 CFR 262.42(a)(1)	$0	$56	$56
10b*	Submit exception report to EPA regional office if don't receive manifest receipt	40 CFR 262.42(a)(2)	$0	$56	$56
11	Prepare procedures to comply with haz waste accumulation storage time limits	40 CFR 262.34	$0	$92	$92
12	Indicate accumulation start date and label each accumulation container	40 CFR 262.34(a)(2)&(3)	$0	$11	$11

Item	RCRA Generator Administrative Requirement	Code of Federal Regulations citations	One-time cost per facility	Annual cost per facility	Annualized cost/facility
13	Inspect waste accumulation container areas weekly	40 CFR 265.174	$1,201	$1,267	$1,427
14	Additional reporting as requested by EPA	40 CFR 262.43	$0	$11	$11
15	RCRA recordkeeping (manifest receipts, inspection records; includes cost for file cabinet)	40 CFR 262.40	$550	$2	$75
		Column totals (average cost per facility) =	$4,733	$4,802	$5,435
C. Total RCRA Administrative Cost to Affected Industrial Laundries:			Initial	Annual	Annualized
			$1,980,000	$2,014,000	$2,279,000

Explanatory Notes:

(a) * Not required of SQGs (i.e. generators between 220 to 2,200 pounds haz waste in a calendar month).

(b) ** The 14 emergency procedures of 40 CFR 265.56 include activating, notifying, identifying, assessing, reporting, ensuring, monitoring, providing, & cleaning activities.

(c) Unit cost sources:

- USEPA-OSW "Supporting Statement for Information Collection Request (ICR) Nr. 0820.08: Hazardous Waste Generator Standards", 22 June 2001. Unit costs adapted from the ICR source document for purpose of estimating economic costs, not just paperwork burden costs of the ICR; http://www.epa.gov/icr/icrlist.html; labor hour data applied from this source, with 2001$ wage rates based on data from Bureau of Labor Statistics (BLS).
- USEPA-OSW "Supporting Statement for Information Collection Request (ICR) Nr. 261.13: Notification of Regulated Waste Activity", 22 July 1999. http://www.epa.gov/opperid1/icrs/icrpages/0261ss13.htm; labor hour data applied from this source, with 2001$ wage rates based on data from BLS.
- USEPA-OECA-ORE "Estimating Costs for the Economic Benefits of RCRA Noncompliance", Table 3-3: Typical Cost Estimates for Generators, Sept 1997. http://www.epa.gov/epaoswer/hazwaste/gener/f006/s0004.pdf; Data from this source updated from 1996$ to 2001$ by the labor cost update multiplier (based on BLS Employment Cost Index) = 1.244

(d) CFR = Code of Federal Regulations: http://www.gpo.gov/nara/cfr/index.html

Estimation of Hypothetical Annual Cost Savings for Management of Industrial Laundry Sludge if Sludges Were Regulated as RCRA "*Derived-From*" Hazardous Waste

- The average annual sludge generation from an industrial laundry that manages reusable wipes is estimated at **81 tons per year**.[14]

- Assuming a $900 per-ton national average cost for RCRA Subtitle C permitted hazardous waste incineration of these sludges, plus another $5,600 per laundry per year for manifesting and transporting these sludges from the laundries to the RCRA-permitted incinerator[15], the annual cost of RCRA hazardous waste management for these sludges could be as high as $78,500 per laundry (i.e. [81 tons x $900/ton] + $5,600).

- The national annual total cost to 590 to 1,175 industrial laundries could be **$46 to $92 million per year** (i.e. (590 x $78,500/year) to (1,175 x $78,500/year).

[14] Average annual sludge generation by industrial laundries derived from the USEPA's 1994 Section 308 survey of industrial laundries.

[15] The RCRA Subtitle C hazardous waste regulations basically require hazardous waste generators to: (a) apply for a USEPA ID number (40 CFR 262.12), (b) avoid accumulating hazardous wastes more than 90 days on-site (40 CFR 262.34), (c) package, mark, placard and manifest all hazardous waste shipments (40 CFR 262.20 to 262.33), and (d) submit a biennial report to USEPA (40 CFR 262.40 to 262.44). Relative to an average 81 tons sludge per laundry per year, the 90-day on-site waste accumulation limit translates into a minimum of four 20-ton shipments per year per laundry (20 tons is equal to one full truckload). The national average, one-way truck transport distance to RCRA-permitted hazardous waste incinerators from industrial waste generators is about 200 miles, and the average truck transport cost (with a RCRA haz waste manifest) is about $0.35/ton-mile for drummed waste (source: USEPA-OSW-EMRAD "Unit Cost Compendium"). The average facility cost for waste transport may be estimated by the following computation: [($0.35/ton-mile) x (200 miles) x (20 tons/trip) x (4 trips/year)] = $5,600 per year per laundry
The $900 per-ton US national average cost for commercial incineration of hazardous wastes (drummed pumpable sludges) is derived from the $225 per drum national average cost reported by the Environmental Technology Council's Sept 2000 national survey database (http://www.etc.org/costsurvey4.cfm), assuming an average 55-gallon drum container of sludge weighs 500 pounds (i.e. 4 drums per ton).

Summary of Estimated Direct Impacts
Potential Incremental Costs & Savings Relative to Current State Policy Baseline

Impact Category	Impact Item	Impact Component (list not in sequential or magnitude order)		A DISPOSABLE WIPES First-year	B DISPOSABLE WIPES Annualized*	C REUSABLE WIPES First-year	D REUSABLE WIPES Annualized*	(A + C) COMBINED IMPACT First-year	(B + D) COMBINED IMPACT Annualized*
Fixed	1A	Read & disseminate rule	Spent solvent wipes generators =	$439,000	$58,000	$5,815,000	$774,000	$6,254,000	$832,000
			Other handlers (e.g. solid waste mgmt; laundries) =	$96,000	$13,000	$26,000	$4,000	$122,000	$17,000
Fixed	1B	Laundries assess customers' RCRA status	Industrial laundry survey cost =	$0	$0	$735,000	$262,000	$735,000	$262,000
			Laundry customer response cost =	$0	$0	$613,000	$218,000	$613,000	$218,000
Variable	2	Wipes accumulation containers		$5,694,000	$1,130,000	$8,146,000	$1,617,000	$13,840,000	$2,747,000
Variable	3A	Closed transport containers for spent wipes (2 options)	If plastic bags	$19,000	$19,000	$499,000	$499,000	$518,000	$518,000
			If metal drums	$12,442,000	$2,836,000	$4,801,000	$1,094,000	$17,243,000	$3,930,000
Variable	3B	Avoid RCRA manifest cost for spent disposables		($3,455,000)	($3,455,000)	$0	$0	($3,455,000)	($3,455,000)
Variable	4	Container labels + affixing labor cost (2 options)	If labels for plastic bags	$61,000	$61,000	$0	$0	$61,000	$61,000
			If labels for metal drums	$702,000	$80,000	$0	$0	$702,000	$80,000
Variable	5A	Labor cost for decanting accumulation containers		$22,000	$22,000	$6,201,000	$6,201,000	$6,223,000	$6,223,000
Variable	5B	Manage "free liquids" collected from accumulation containers (2 options):	If fuel blenders =	$8,000	$8,000	$2,873,000	$2,873,000	$2,881,000	$2,881,000
			If solvent recycling =	($6,000)	($6,000)	($2,326,000)	($2,326,000)	($2,332,000)	($2,332,000)
Fixed	5C	Sample wipes for 5-gram "dry" (2 options)		$520,000	$69,000	$0	$0	$520,000	$69,000
Variable	6	Intra-company transfers	If plastic bags	$4,000	$4,000	$0	$0	$4,000	$4,000
			If metal drums	$657,000	$146,000	$0	$0	$657,000	$146,000
Variable	7	Transfers to intermediate handler (another company)	If plastic bags	$4,000	$4,000	$0	$0	$4,000	$4,000
			If metal drums	$657,000	$146,000	$0	$0	$657,000	$146,000
Variable	8A	Avoid RCRA Subtitle C disposal cost for spent disposables:		($32,971,000)	($32,971,000)	$0	$0	($32,971,000)	($32,971,000)
Variable	8B	Labor for decanting percolated "free liquids"		$10,000	$10,000	$121,000	$121,000	$131,000	$131,000
Variable	8C	Manage "free liquids" collected from transport containers (2 options):	Manifest + truck >	$0	$0	$1,514,000	$1,514,000	$1,514,000	$1,514,000
			If fuel blenders =	$10,000	$10,000	$187,000	$187,000	$197,000	$197,000
			If solvent recycling =	($8,000)	($8,000)	($151,000)	($151,000)	($159,000)	($159,000)
Fixed	9A	Demonstrate RCRA exclusion to inspectors	Cost to wipes generators =	$3,000	$3,000	$33,000	$33,000	$36,000	$36,000
			Cost to other wipes handlers =	$152,000	$152,000	$400	$400	$152,400	$152,400
			Cost to state agencies =	$52,000	$52,000	$380,000	$380,000	$432,000	$432,000
Fixed	9B	Avoid SQG RCRA Subtitle C regulatory cost		($784,000)	($784,000)	$0	$0	($784,000)	($784,000)
SUMMARIES:									
			Max net savings impact (lowest costs + highest savings) =	($30,150,000)	($35,630,000)	$21,610,000	$9,150,000	($8,540,000)	($26,480,000)
			Fixed (independent of annual wipes quantity) =	$271,000	($644,000)	$7,189,000	$1,258,000	$7,460,000	$614,000
			Variable (dependent on annual wipes quantity) =	($30,421,000)	($34,986,000)	$14,421,000	$7,892,000	($16,000,000)	($27,094,000)
			% variable impact component =	99%	98%	67%	86%	68%	98%
			Max net cost impact (highest costs + lowest savings) =	($15,750,000)	($32,480,000)	$31,450,000	$15,280,000	$15,700,000	($17,200,000)
			Fixed (independent of annual wipes quantity) =	$271,000	($644,000)	$7,189,000	$1,258,000	$7,460,000	$614,000
			Variable (dependent on annual wipes quantity) =	($16,021,000)	($31,836,000)	$24,261,000	$14,022,000	$8,240,000	($17,814,000)
			% variable impact component =	98%	98%	77%	92%	52%	97%
			Mid-point impact (average of max net savings & max net cost) =	($22,950,000)	($34,055,000)	$26,530,000	$12,215,000	$3,580,000	($21,840,000)
Implementation costs without annualized cost savings added:									
			Min cost (lower cost options) =	$7,074,000	$1,594,000	$24,087,000	$11,627,000	$31,161,000	$13,221,000
			Max cost (higher cost options) =	$21,460,000	$4,730,000	$31,450,000	$15,280,000	$52,910,000	$20,010,000
			Potential Cost Savings w/out implementation costs:	($37,224,000)	($37,224,000)	($2,477,000)	($2,477,000)	($39,701,000)	($39,701,000)
Reusable wipes impact items used as input to simulation of induced market impact on industrial laundries:									
			Min cost (low-cost options for 1A+1B+3A+4+5B+8B+8C+9A) =			$418,000	($77,000)		
			Max cost (if also include 5A + high-cost options) =			$16,458,000	$12,256,000		

EXPLANATORY NOTES:

(a) * Annualized impacts equal first-year impacts for those components which are annually-recurring.

(b) Non-recurring, first-year lump-sum impacts annualized by applying discount rate = 7.0%

(c) Zero ($0) indicates impact elements which are not incremental to the proposed rule, because incurred under current baseline.

(d) Parentheses indicate anticipated avoided costs (i.e. cost savings), incremental to current baseline.

! ** Other entities = (1) solid waste management facilities (i.e. operators of incinerators, combustors & landfills), and (2) industrial laundries (i.e. suppliers of reusable wipes).

! *** These items are "fixed" from perspective of wipes generators; however, these items are "variable" according to number of customers, from perspective of laundries.

Attachment Set F

Induced Market Impacts

**(cobweb-type partial equilibrium model
for simulation of potential impact of exclusions
on US marketshare and relative price for industrial wipes)**

Description of the Cobweb-Type Partial Equilibrium Market Model Applied in this Study for Simulating Possible Induced Effects on the US National Market for Industrial Wipes

The following spreadsheets present the cobweb[16]-type partial equilibrium market model developed in this study, for purpose of simulating potential induced effects of the proposed rule, on the US industrial wipes market. Basically, a "*partial equilibrium model*" is a mathematical economics method which may be applied, among other purposes, for modeling the economic effects of regulatory compliance costs on producers (market supply) and consumers (market demand) in a single affected market.[17] In this study, the partial equilibrium model simulates the following supply and demand features of the national market for industrial wipes, by including these features as exogenous computational elements in the model (i.e. elements whose values are determined outside the model, and which are used as inputs to the model):

Elements of Cobweb-Type Partial Equilibrium Model for the US National Market for Industrial Wipes			
Element	Definition		
Wipes products & market conditions:	This market is defined as consisting of two categories of potentially substitutable (i.e. price-competing) types of industrial wipes products: ! disposable wipes (e.g. paper & recycled rags) ! reusable wipes (cloth) each with its own unique US national average price ($/wipe) and proportion of the total US national sales marketshare for industrial wipes (i.e. annual quantity industrial wipes supplied to (sold) on the US national market).		
Regulatory compliance costs:	The model presents two alternative responses by industrial laundry suppliers of reusable wipes, in dealing with regulatory exemption compliance costs (reflecting two alternative laundry-to-customer relationship scenarios):	! Lower-bound:	Industrial laundries incur only their share of regulatory exemption compliance costs.
		! Upper-bound:	Industrial laundries incur their own share plus their customers' share of regulatory exemption compliance costs.

[16] The name "***cobweb***" comes from the graphical representation of this model as a two-axis diagram of price versus quantity, where the sequential time-lagged adjustment mechanism tracks-out a two-dimensional geometric path resembling a cobweb (spider web) pattern, after multiple iterations of the mechanism. Cobweb-type models of market pricing adjustment date back to 1917, mostly applied to agricultural markets, but have similar applicability for modelling price adjustments in manufactured goods markets. A convenient review of cobweb modelling history, attributes, and economics applications is provided in Waugh, Frederick V., "Cobweb Models", Journal of Farm Economics, Vol.46, 1964, pp.732-750. In addition to the cobweb model, there are other published market price adjustment models based on alternative economic theories and mathematical formulations (in varying degrees of simplicity and complexity) available for simulating and explaining market adjustment processes such as the: (a) Tatonnement process model, (b) Edgeworth exchange model, and (c) Marshall stability hypothesis model.

[17] The following USEPA economic analysis guidance documents provide descriptive information about the "***partial equilibrium analysis***" method:
! USEPA Office of the Administrator, "Guidelines for Preparing Economic Analyses", EPA-240-R-00-003, Sept 2000, Section 8.4.3, pp. 125 to 126 (http://yosemite.epa.gov/ee/epa/eed.nsf/pages/guidelines).
! USEPA Office of Air Quality Planning and Standards (OAQPS), Innovative Strategies and Economics Group, "OAQPS Economic Analysis Resource Document", April 1999, Section 5.1.2, pp. 5-3 to 5-50 (http://www.epa.gov/ttn/ecas/econdata/6807-305.pdf).

Regulatory compliance cost pass-thru:	For both customer relationship scenarios above, the model also distinguishes two possible business (firm-level) behavioral responses to regulatory exemption compliance costs on the behalf of industrial laundry suppliers of reusable wipes (source: these percentages are from the USEPA Office of Water, "Economic Assessment for the Final Action Regarding Pretreatment Standards for the Industrial Laundries Point Source Category", EPA-821-R-00-004, March 2000, p.A-23, http://www.epa.gov/ost/guide/laundry/final/economics.pdf).	Industrial laundries absorb a portion (68%) of compliance costs by cutting annual business profits.	
		Industrial laundries pass-thru a portion (32%) of compliance costs in the form of higher reusable wipes prices.	
Industrial wipes profit margin:	The model applies an exogenously determined average national industrial laundry profit margin on industrial reusable wipes, in order to establish a baseline from which to subtract the fraction of compliance costs that are assumed internalized (incurred) by industrial laundries rather than passed-thru to reusable wipes customers.		
Price elasticities of demand:	There are two separate but complementary marketshare equilibrium adjustment components to the model (each with its own spreadsheet presented in this document):	! Own-price elasticity:	Assigns a percentage decrease in national aggregate demand for reusable wipes in relation to a percentage increase in the national average reusable wipes price after compliance cost pass-thru.
		! Cross-price elasticity:	Assigns a percentage decrease in national aggregate demand for reusable wipes in relation to a percentage decrease in the national average disposable wipes price after compliance savings.
Sensitivity analysis:	This model is subject to the same set of sensitivity analysis involving the computational (input) parameters identified elsewhere in this document.		

The endogenous mechanism in the model is a cobweb-type price adjustment, which endogenously simulates a recursive (iterative) time-lagged process whereby the national industrial wipes market establishes a new equilibrium between supply and demand for industrial wipes, in response to a hypothetical disturbance (fluctuation) in the base-year national average price of wipes in this market. The estimated impacts of the proposed rule on both reusable and disposable wipes constitute the hypothetical disturbance in wipes prices, assuming that these impacts --- in part and in whole, respectively — manifest themselves in the form of:

- ! higher average prices charged by industrial launderers for supplying reusable wipes, and
- ! lower average life cycle costs to disposable wipes users.

This equilibrium adjustment is founded on the assumption that reusable and disposable industrial wipes are to some degree, price-competing substitutes to some users in some applications. The degree of this substitution is expressed numerically by price-elasticities of demand as factors built-in to the cobweb-type market model. Basically, the mathematically iterative nature of the model simulates temporal dynamics in the market, and is based on the premise that there is a time-lag between a change in price and market demand, according to the following basic cobweb modeling steps (mathematical iterations):

- **Baseline condition:** The first step of the model (time period = base year) simulates an increase in the national average price for reusable industrial wipes, as an induced effect from the proposed rule, under the assumption that industrial laundry suppliers of reusable wipes may pass-through some portion of the regulatory exemption compliance costs to wipes customers, in the form of higher prices for reusable wipes.

- **First model iteration:** The second step of the model (time period = base year +1 year) simulates a decrease in the national aggregate demand for resusable wipes, as a possible customer response according to the price elasticity of market demand for reusable wipes (i.e. as the price of reusable wipes increases, customer demand decreases).

- **Second iteration:** The model subsequently shifts this decreased market demand for reusable wipes, to an increase in market demand for disposable wipes, under the constraint that the same national annual demand for wipes (reusables + disposables) before the market disturbance (i.e. pre-regulation), must be met after the disturbance (i.e. post-regulation).

- **Subsequent iterations:** However, because of the fact that the cost pass-thru component of the cobweb model calculates (in time period = base year + 1 year) a new higher price for reusable wipes based on the rule's estimated implementation (compliance) cost pass-thru in relation to the base-year reusable wipes marketshare (i.e. time period = baseline), there is a time-lag built into the model, whereby each increment in time is simulated as one-year (i.e. annual time-lag), although actual price adjustment processes may occur in smaller time increments of hours, days, weeks, or months, depending upon the type and size of economic market. Consequently, the model simulates a new reusable wipes national average price in each subsequent year (time period), based on prior year marketshare (annual wipes quantity sold), by maintaining both a constant after-tax profit margin (as percentage of reusable wipes annual sales revenues) and a constant annual after-tax profit, for industrial laundry suppliers of reusable wipes. The model endogenously makes multiple year iterations (i.e. (base year + 1 year), to (base year + 6 years)) to mathematically converge to a market equilibrium reusable wipes price.

The outputs of the model are mathematically-simulated, potential new equilibrium values for the following US national market characteristics for industrial wipes:

- Industrial laundry implementation (rule compliance) costs under the model-simulated dynamic market conditions (which may be more or less than compliance costs as estimated under initial static market conditions).
- National average unit costs ($/wipe) for both reusable and disposable industrial wipes (wipes "unit cost" in the model includes the market supplier price for the wipe, plus any additional costs to the wipes user for life-cycle management of the wipe, such as cost for disposal of the spent wipe as solid waste).
- National marketshare for both reusable and disposable industrial wipes.
- National annual total market cost (i.e. annual real resource cost) for both reusable and disposable industrial wipes.

USEPA operationalized this model as three distinct computation (spreadsheet) modules:

- Module I: Potential reusable wipes price adjustment and national market response according to own-price elasticity mechanism.
- Module II: Same as Module I but with cross-price elasticity applied in place of own-price elasticity.
- Module III: A possible composite (net) effect taking both types of price elasticity into account.

The following table displays the mathematical components of the cobweb-type spreadsheet model according to the three modules. The computation results for each module are displayed in three spreadsheets which follow the table.

Mathematical Components of the Cobweb-Type Partial Equilibrium Market Model
Developed in this Study for Simulation of Potential Induced Effects on the US National Market for Industrial Wipes

Mathematical symbol key:
- First character (capital letter) designates economic variable (P=price; Q=quantity; R=revenue; F=profit; I=impact*; E=elasticity**)
- Second character (small letter) designates type of wipe (r=reusable; d=disposable; n=national)
- Third character (number) designates time period (0=base year; 1=base + 1 year; 2=base + 2; t=base + t-years); absence designates constant element.

Model Module	Reusable Wipes Market	Disposable Wipes Market	Combined National Market (Reusables & Disposables)
Module I. Own-Price Elasticity Module	! Fr remains constant ! Rr0 = Qr0 x Pr0 ! Fr0 = Rr0 x 14% ! Pr1 = (Rr0 + Ir0)/Qr0 (initial price adjustment) ! Qr1 = Qr0 + [E(own)r x ((Pr1 - Pr0)/Pr0) x Qr0] ! Rr1 = Qr1 x Pr1 ! Ir1 = [(Qr1/Qr0) x (Ir0 x 95%)] + [Ir0 x (100% - 95%)] ! Fr1 = (Rr1 - Ir1) - (Pr0 x (100% - 14%) x Qr1)	! Pd decreases ! Qd increases ! Id remains constant ! Rd0 = Qd0 x Pd0 ! Pd1 = (Rd0 + Id)/Qd0 ! Qd1 = Qn - Qr1 ! Rd1 = Qd1 x Pd1	! Qr0 + Qd0 = Qn ! Qr1 + Qd1 = Qn ..... ! Qrt + Qdt = Qn
Module II. Cross-Price Elasticity Module	! Pr1 = (Rr0 + Ir0)/Qr0 ! Qr1 = Qr0 + [E(cross)r x ((Pd1- Pd0)/Pd0) x Qr0] ! Rr1 = Qr1 x Pr1 ! Ir1 = [(Qr1/Qr0) x (Ir0 x 95%)] + [Ir0 x (100% - 95%)] ! Fr1 = (Rr1 - Ir1) - [(Pr0 x (100% - 14%) x Qr1)]		
Module III. Composite Effect Module (own- & cross-price elasticity)	! Qr1 = Qr0 + [(Qr1 - Qr0) + (Qr1 - Qr0)] module I module II ! Pr1 = (Rr0 + Ir)/Qr0 ! Ir1 = [(Qr1/Qr0) + (Ir0 x 95%)] x [Ir0 x (100% - 95%)] ! Fr1 = (Rr1 - Ir1) - [(Pr0 x (100% -14%) x Qr1] ! Qr2 = Qr0 + [(Qr2 - Qr0) + (Qr2 - Qr0)] module I module II ! Pr2 = ((Rr1 + (Fr0 - Fr1))/Qr2		

Explanatory Notes:

(a) * Ir >$0 (i.e. net annual cost, depends upon % pass-thru and % absorbed into industrial launderer profits); Id <$0 (net annual cost savings).

(b) ** Price elasticities of demand are defined mathematically as follows:
- Own-price demand elasticity: E(own) = (%change Qr)/(%change Pr) = [(Qr1 - Qr0)/Qr0] / [(Pr1 - Pr0)/Pr0]
- Cross-price demand elasticity: E(cross) = (%change Qr)/(%change Pd) = [(Qr1 - Qr0)/Qr0] / [(Pd1 - Pd0)/Pr0]

(c) 14% represents the US national average (1992 & 1997) after-tax profit rate for the laundry cleaning & garment services industry (SIC code 721).

(d) 95% represents the overall % of compliance impacts on industrial laundries (reusable wipes) which are variable according to annual wipes quantity.

MODULE I:
OWN-PRICE ELASTICITY MODEL

RELATIVE PRICE/QUANTITY OF REUSABLE & DISPOSABLE INDUSTRIAL SOLVENT WIPES
SIMULATION OF POTENTIAL CHANGE IN RELATIVE PRICE & MARKETSHARE

											Percent of annualized compliance cost which is variable to annual quantity wipes supplied>			97%
		REUSABLE WIPES MARKET						DISPOSABLE WIPES MARKET				COMBINED MARKET		
		A	B	C	D	E	F	G	H	I	J	K	L	M
Row Item	Simulation Iteration Period	Annual Qnty Affected Reusable Wipes Used	Effective Unit Cost Per Use ($/wipe)	Implied % change unit cost	Annual Affected Reusable Revenues	Annual After-tax Profit to Affected Laundries	Annualized Compliance Cost Pass-thru 32%	Annual Quantity Disposables Wipes Used	Effective Unit Cost Per Use ($/wipe)	Annual Effective Cost Impact	Annual Disposable Effective Cost to Users	Annual Qnty Unaffected Solvent Wipes (CEGs+contrzd)	(A + G + K) Annual Demand for Solvent Wipes (Reusbl+Dispbl)	Annual Total Effective Cost for All Solvent Wipes
		-0.527	<Reusables "own" elasticity coefficient*			14.4%	<Baseline after-tax profit rate (SIC code 721)							
1	Baseline	2,548,204,365	$0.0535		$136,331,455	$19,632,117	$0	258,719,583	$0.2336	$0	$60,447,558	423,118,915	3,230,042,863	$229,824,203
2	Base+1						$1,948,800			($34,060,000)				
3	Base+1		$0.0543	1.429%					$0.1020					
4	Base+1	2,529,000,671			$137,238,152	$15,342,559		277,923,277			$28,346,198	423,118,915	3,230,042,863	$198,629,540
5	Base+2						$1,934,521							
6	Base+2		$0.0543	1.562%										
7	Base+2	2,527,226,356			$137,320,443	$15,537,771		279,697,592			$28,527,165	423,118,915	3,230,042,863	$198,892,799
8	Base+3						$1,933,202							
9	Base+3		$0.0543	1.551%										
10	Base+3	2,527,362,545			$137,314,136	$15,527,929		279,561,404			$28,513,275	423,118,915	3,230,042,863	$198,872,601
11	Base+4						$1,933,303							
12	Base+4		$0.0543	1.548%										
13	Base+4	2,527,403,078			$137,312,258	$15,523,949		279,520,870			$28,509,141	423,118,915	3,230,042,863	$198,866,589
14	Base+5						$1,933,333							
15	Base+5		$0.0543	1.548%										
16	Base+5	2,527,404,713			$137,312,182	$15,523,733		279,519,235			$28,508,974	423,118,915	3,230,042,863	$198,866,347
17	Base+6						$1,933,334							
18	Base+6		$0.0543	1.548%										
19	Base+6	2,527,404,229			$137,312,205	$15,523,776		279,519,719			$28,509,024	423,118,915	3,230,042,863	$198,866,419
					Return on revenue>	11.3%	$1,933,334							
	Induced change=	(20,800,136)			$980,750	($4,108,342)		20,800,136			($31,938,534)			($30,957,784)
	% change =	-0.8%	1.5%		0.7%	-20.9%	-0.8%	8.0%	-56.3%		-52.8%			-13.5%
				% all reusable wipes revenue =	0.2%	-1.0%								
				% laundry revenue =	0.0%	-0.2%								

* OSW-EMRAD derived an estimated "own" price elasticity based on statistical regression analysis of 1978-1993 historical market data for industrial laundries from USEPA Office of Water (EPA-821-R-00-004, March 2000).

MODULE II:
CROSS-PRICE ELASTICITY MODEL

RELATIVE PRICE/QUANTITY OF REUSABLE & DISPOSABLE INDUSTRIAL SOLVENT WIPES
SIMULATION OF POTENTIAL CHANGE IN RELATIVE PRICE & MARKETSHARE

Percent of annualized compliance cost which is variable to annual quantity wipes supplied> 97%

		REUSABLE WIPES MARKET					DISPOSABLE WIPES MARKET				COMBINED MARKET		
		A	B	C	D	E	F	G	H	I	J	K	L
Row Item	Simulation Iteration Period	Annual Qnty Affected Reusable Wipes Used	Effective Unit Cost Per Use ($/wipe)	Annual Affected Reusable Revenues	Annual After-tax Profit to Affected Laundries	Annualized Compliance Cost Pass-thru 32%	Annual Quantity Disposables Wipes Used	Effective Unit Cost Per Use ($/wipe)	Annual Effective Cost Impact	Annual Disposable Effective Cost to Users	Annual Qnty Unaffected Solvent Wipes (CESQGs)	(A + F + J) Annual Demand for Solvent Wipes (Reusbl+Dispbl)	Annual Total Effective Cost for All Solvent Wipes
		0.137	<"Cross" elasticity coefficient*		14.4%	<Baseline after-tax profit rate (SIC code 721)							
1	Baseline	2,548,204,365	$0.0535	$136,331,455	$19,632,117	$0	258,719,583	$0.2336	$0	$60,447,558	423,118,915	3,230,042,863	$229,824,203
2	Base+1					$1,948,800			($34,060,000)				
3	Base+1		$0.0543					$0.1020					
4	Base+1	2,351,391,805		$127,600,071	$13,970,440		455,532,143			$46,461,039	423,118,915	3,230,042,863	$207,106,300
5	Base+2					$1,802,458							
6	Base+2		$0.0550										
7	Base+2	2,351,391,805		$129,431,525	$16,112,870		455,532,143			$46,461,039	423,118,915	3,230,042,863	$208,937,754
8	Base+3					$1,802,458							
9	Base+3		$0.0549										
10	Base+3	2,351,391,805		$129,120,548	$15,801,894		455,532,143			$46,461,039	423,118,915	3,230,042,863	$208,626,778
11	Base+4					$1,802,458							
12	Base+4		$0.0549										
13	Base+4	2,351,391,805		$129,120,548	$15,801,894		455,532,143			$46,461,039	423,118,915	3,230,042,863	$208,626,778
14	Base+5					$1,802,458							
15	Base+5		$0.0549										
16	Base+5	2,351,391,805		$129,120,548	$15,801,894		455,532,143			$46,461,039	423,118,915	3,230,042,863	$208,626,778
17	Base+6					$1,802,458							
18	Base+6		$0.0549										
19	Base+6	2,351,391,805		$129,120,548	$15,801,894		455,532,143			$46,461,039	423,118,915	3,230,042,863	$208,626,778
				Return on revenue>	12.2%	$1,802,458							
			$0.0565										
	Induced change=	(196,812,560)		($7,210,907)	($3,830,224)		196,812,560			($13,986,519)			($21,197,425)
	% change =	-7.7%	5.7%	-5.3%	-19.5%	-7.5%	76.1%	-56.3%		-23.1%			-9.2%
			% all reusable revenue =	-1.7%	-0.9%								
			% laundry revenue =	-0.3%	-0.2%								

* In absence of market data, OSW-EMRAD estimated "cross" price elasticity, by multiplying the absolute value of "own" elasticity, by an average ratio own:to:cross elasticities based on other published studies = 26.0%

MODULE III:
COMPOSITE MODEL MODULE (OWN + CROSS ELASTICITY EFFECTS)

RELATIVE PRICE/QUANTITY OF REUSABLE & DISPOSABLE INDUSTRIAL SOLVENT WIPES
SIMULATION OF POTENTIAL CHANGE IN RELATIVE PRICE & MARKETSHARE

Select % variable> 97.2%

		REUSABLE WIPES MARKET						DISPOSABLE WIPES MARKET				COMBINED MARKET		
		A	B	C	D	E	F	G	H	I	J	K	L	M
Row Item	Simulation Iteration Period	Own+Cross Change in in Annual Reusable Qnty	Annual Qnty Affected Reusable Wipes Used	Effective Unit Cost Per Use ($/wipe)	Annual Affected Reusable Revenues	Annual After-tax Profit to Affected Laundries	Annualized Compliance Cost Pass-thru	Annual Quantity Disposables Wipes Used	Effective Unit Cost Per Use ($/wipe)	Annual Effective Cost Impact	Annual Disposable Effective Cost to Users	Annual Qnty Unaffected Solvent Wipes (CESQGs)	(B + G + K) Annual Demand for Solvent Wipes (Reusbl+Dispbl)	Annual Total Effective Cost for All Solvent Wipes
		Composite Effect (own- + cross-price elasticities):				14.4%	32%	<Baseline after-tax profit rate (SIC code 721)						
1	Baseline		2,548,204,365	$0.0535	$136,331,455	$19,632,117	$0	258,719,583	$0.2336	$0	$60,447,558	423,118,915	3,230,042,863	$229,824,203
2	Base+1						$1,948,800			($34,060,000)				
3	Base+1			$0.0543					$0.1020					
4	Base+1	(216,016,254)	2,332,188,111		$126,557,968	$13,822,082		474,735,837			$48,419,679	423,118,915	3,230,042,863	$208,022,838
5	Base+2						$1,788,179							
6	Base+2			$0.0551										
7	Base+2	(217,790,569)	2,330,413,796		$128,470,309	$16,158,320		476,510,152			$48,600,647	423,118,915	3,230,042,863	$210,116,146
8	Base+3						$1,786,860							
9	Base+3			$0.0550										
10	Base+3	(217,654,381)	2,330,549,984		$128,154,519	$15,838,995		476,373,964			$48,586,757	423,118,915	3,230,042,863	$209,786,466
11	Base+4						$1,786,961							
12	Base+4			$0.0550										
13	Base+4	(217,613,847)	2,330,590,518		$128,152,578	$15,834,952		476,333,430			$48,582,622	423,118,915	3,230,042,863	$209,780,391
14	Base+5						$1,786,991							
15	Base+5			$0.0550										
16	Base+5	(217,612,212)	2,330,592,153		$128,152,477	$15,834,711		476,331,795			$48,582,456	423,118,915	3,230,042,863	$209,780,123
17	Base+6						$1,786,992							
18	Base+6			$0.0550										
19	Base+6	(217,612,212)	2,330,592,153		$128,152,525	$15,834,756		476,331,795			$48,582,456	423,118,915	3,230,042,863	$209,780,171
					Return on revenue>	12.4%	$1,786,992							
				$0.0566										
		Induced change=	(217,612,212)		($8,178,930)	($3,800,000)		217,612,212			($11,865,102)			($20,044,032)
		% change =	-8.5%	5.8%	-6.0%	-19.4%	-100.0%	84.1%	-56.3%		-19.6%			-8.7%
					% all reusable revenue =	-2.0%	-0.9%							
					% laundry revenue =	-0.4%	-0.2%							

* In absence of market data, OSW-EMRAD estimated "cross" price elasticity, by multiplying the absolute value of "own" elasticity, by an average ratio own:to:cross elasticities based on other published studies = 26.0%

Attachment Set G

Small Business Impacts

Small Business Impacts

The following series of spreadsheets display the results of the small business impact analysis, as well as contains supplementary small business data and impact estimation tables. The following analysis applied US Small Business Administration definitions of "***small firms***" (based either on company number of employees, or company annual revenues), in relation to 1997 Bureau of Census data categorized into seven small firm size bins.
These findings are presented for two separate small business categories:

- **!** Industrial wipes users ("generators")
- **!** Reusable industrial wipes laundries

For the industrial laundry small business impact analysis, the 1997 Bureau of Census count of establishments were categorized into ten (decile) wipes business volume bins, reflecting the fact that industrial laundries receive and launder other types of items. The small business impact analysis includes both direct and induced impact estimates, expressed on an average annualized basis at the firm level. The USEPA's small business impact guidance is applied for purpose of benchmarking the estimated number of impacted small firms, and the monetary magnitude significance of such potential impacts.

DEFINITION OF "SMALL" BUSINESS ESTABLISHMENT SIZE BINS (BASED ON 1997 ECONOMIC CENSUS FIRM SIZE DATA)

Item	Sub-Sector	NAICS subsector code	NAICS industry code	Small firm bin size units	Small Firm Size Bins							SBA Small Firm Size Standard*
					Bin#1	Bin#2	Bin#3	Bin#4	Bin#5	Bin#6	Bin#7	
1	Printing	323	323110	Employees	1 to 4	5 to 9	10 to 19	20 to 49	50 to 99	100 to 249	250 to 499	500
2	Chemical & Allied Products	325	325998	Employees	1 to 4	5 to 9	10 to 19	20 to 49	50 to 99	100 to 249	250 to 499	500**
3	Plastics & Rubber	326	326199	Employees	1 to 4	5 to 9	10 to 19	20 to 49	50 to 99	100 to 249	250 to 499	500**
4	Fabricated Metal Products	332	332322	Employees	1 to 4	5 to 9	10 to 19	20 to 49	50 to 99	100 to 249	250 to 499	500**
5	Industrial Machinery & Eqpt	333	333514	Employees	1 to 4	5 to 9	10 to 19	20 to 49	50 to 99	100 to 249	250 to 499	500**
6	Electronics & Computers	3344	334419	Employees	1 to 4	5 to 9	10 to 19	20 to 49	50 to 99	100 to 249	250 to 499	500**
7	Transportation Eqpt	336	336399	Employees	1 to 4	5 to 9	10 to 19	20 to 49	50 to 99	100 to 249	250 to 499	500**
8	Furniture & Fixtures	337	337122	Employees	1 to 4	5 to 9	10 to 19	20 to 49	50 to 99	100 to 249	250 to 499	500
9	Auto Dealers (retail trade)	441	441	Revenues	<$250k	$250k to $499k	$500k to $999k	$1000k to $2499k	$2500k to $4999k	$5.0 to $9.9mil	$10mill to 24.9mil	$17 - $21 million
10	Publishing (printed matter)	5111	5111	Employees	<5	5 to 9	10 to 19	20 to 49	50 to 99	100 to 249	250 to 499	500
11	Business services (copy shops)	561439	561439	Revenues	<$100k	$100k to $249k	$250k to $499k	$500k to $999k	$1000k to $2499k	$2500k to $4999k	Not applicable	$5 million
12	Auto Repair & Maintenance	8111	8111	Revenues	<$100k	$100k to $249k	$250k to $499k	$500k to $999k	$1000k to $2499k	$2500k to $4999k	Not applicable	$5 million
13	Military Bases	92812	92812	Not relevant – not a business establishment category								
14	Industrial Laundries	812332	812332	Revenues	<$100k	$100k to $249k	$250k to $499k	$500k to $999k	$1000k to $2499k	$2500k to $4999k	$5mil to $10mil	$10.5 million

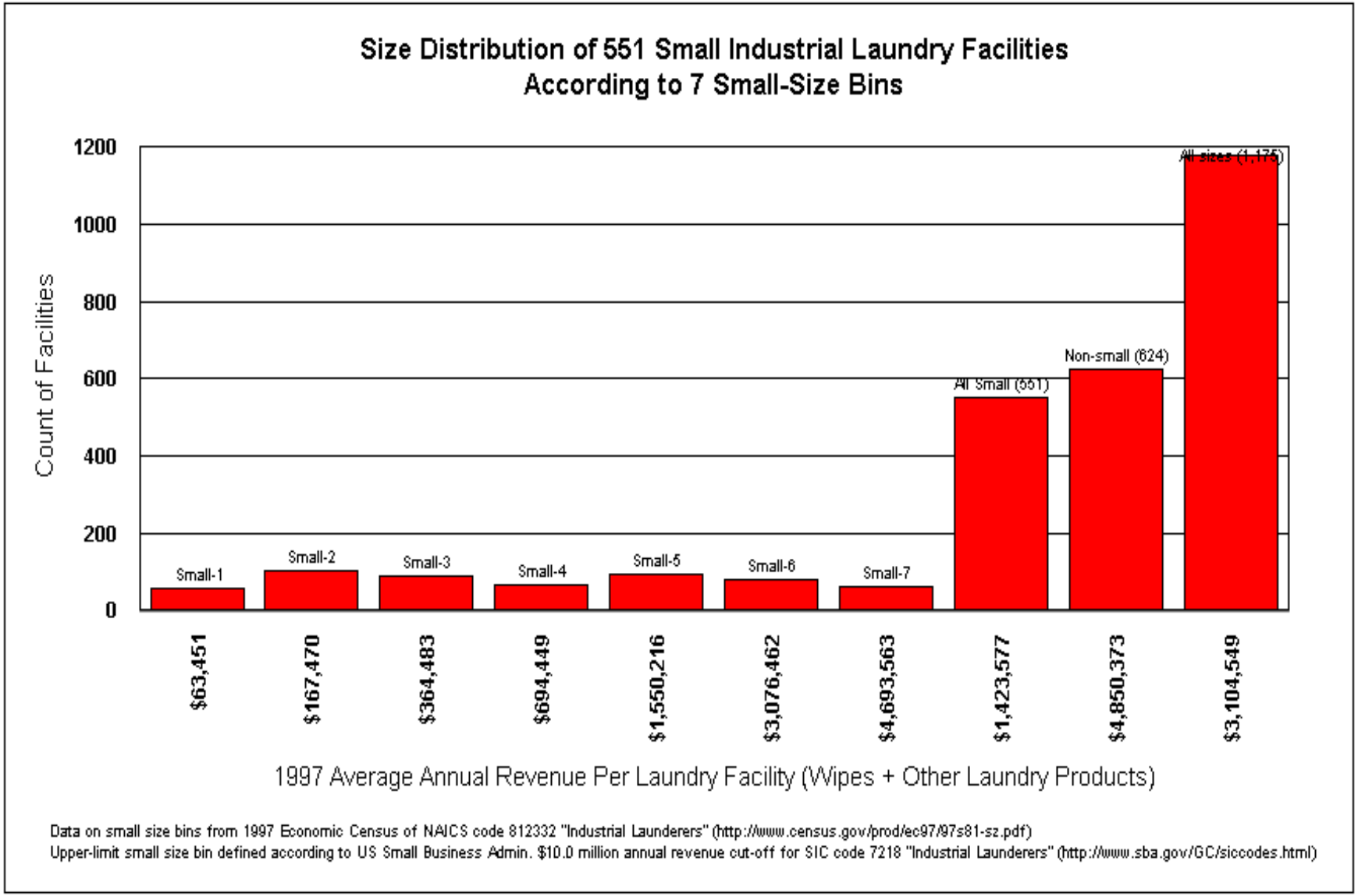
Explanatory Notes:

(a) * SBA small firm size standards: http://www.sba.gov/size

(b) ** Indicates that 500 employees applied in this document as the SBA size standard for six sub-sectors which are composed of some industries that have 750 or 1,000 employee size standards.

(c) Use of 500 employees for these six sub-sectors facilitates the convenient use of NAICS code data from the 1997 Economic Census: http://www.census.gov/epcd/www/econ97.html

Histogram Summary of Industrial Laundry Facility Sizes



Assignment of Annual Wipes Revenue by Laundry Facility Size Class (2001)

Note: This table used to calibrate the economic model to Bureau of Census benchmark datum (revenues)

Percentage of laundry revenues from wipes	$37,514	$99,014	$215,494	$410,581	$916,538	$1,818,905	$2,774,987	$841,665	$2,867,698	<<<Imputed median	
	Small-1	Small-2	Small-3	Small-4	Small-5	Small-6	Small-7	All Small	Non-small	All sizes	
10%	$3,751	$9,901	$21,549	$41,058	$91,654	$181,890	$277,499	$84,166	$286,770	$183,551	
20%	$7,503	$19,803	$43,099	$82,116	$183,308	$363,781	$554,997	$168,333	$573,540	$367,102	
30%	$11,254	$29,704	$64,648	$123,174	$274,961	$545,671	$832,496	$252,499	$860,310	$550,653	
40%	$15,006	$39,606	$86,198	$164,232	$366,615	$727,562	$1,109,995	$336,666	$1,147,079	$734,204	
50%	$18,757	$49,507	$107,747	$205,291	$458,269	$909,452	$1,387,493	$420,832	$1,433,849	$917,755	
60%	$22,508	$59,408	$129,296	$246,349	$549,923	$1,091,343	$1,664,992	$504,999	$1,720,619	$1,101,306	
70%	$26,260	$69,310	$150,846	$287,407	$641,577	$1,273,233	$1,942,491	$589,165	$2,007,389	$1,284,857	
80%	$30,011	$79,211	$172,395	$328,465	$733,230	$1,455,124	$2,219,989	$673,332	$2,294,159	$1,468,408	
90%	$33,763	$89,112	$193,945	$369,523	$824,884	$1,637,014	$2,497,488	$757,498	$2,580,929	$1,651,959	
100%	$37,514	$99,014	$215,494	$410,581	$916,538	$1,818,905	$2,774,987	$841,665	$2,867,698	$1,835,510	
									Weighted average wipes revenue per laundry =	$351,601	

National Annual Wipes Revenues Subtotaled by Size Class (2001):

10%	$135,051	$663,392	$1,249,866	$1,847,615	$5,774,190	$9,640,194	$11,099,947	$30,410,255	$117,288,865	$147,699,120	35.8%
20%	$82,531	$415,858	$775,779	$1,149,627	$3,666,152	$6,184,275	$7,214,966	$19,489,188	$73,986,619	$93,475,807	22.6%
30%	$22,508	$118,817	$193,945	$246,349	$824,884	$1,637,014	$1,664,992	$4,708,509	$18,926,810	$23,635,318	5.7%
40%	$30,011	$158,422	$258,593	$328,465	$1,099,846	$2,182,685	$2,219,989	$6,278,012	$25,235,746	$31,513,758	7.6%
50%	$18,757	$99,014	$215,494	$205,291	$916,538	$1,818,905	$1,387,493	$4,661,491	$18,640,040	$23,301,531	5.6%
60%	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	0.0%
70%	$26,260	$69,310	$150,846	$287,407	$641,577	$1,273,233	$1,942,491	$4,391,123	$18,066,500	$22,457,623	5.4%
80%	$30,011	$79,211	$172,395	$328,465	$733,230	$1,455,124	$2,219,989	$5,018,426	$20,647,429	$25,665,855	6.2%
90%	$0	$89,112	$193,945	$0	$824,884	$1,637,014	$0	$2,744,955	$10,323,714	$13,068,670	3.2%
100%	$37,514	$99,014	$215,494	$410,581	$916,538	$1,818,905	$2,774,987	$6,273,032	$25,809,286	$32,082,318	7.8%
Col. totals =	$382,644	$1,792,150	$3,426,356	$4,803,799	$15,397,840	$27,647,349	$30,524,854	$83,974,991	$328,925,009	$412,900,000	100.0%
									2001-updated Census data benchmark (annual reusable wipes revenues) used to impute (backsolve) laundry size bin median revenues* >	$412,900,000	

Explanatory Notes:

! Calibration performed by setting "percentage of states adopting" the exclusions to 100%.

! *$412.9 million in annual revenues used for calibration point; based on 1997 Economic Census revenues for SIC code 7218 “Industrial Laundries” (NAICS code 812332), updated by USEPA-OSW to year 2001 by multiplying with the factor = 1.0124 (which is the 2001/1997 ratio in average lease price for reusable wipes = 114.2/112.8).

SUMMARY OF ESTIMATED AVERAGE ANNUAL IMPACTS
ACCORDING TO AVERAGE ANNUAL IMPACT PER AFFECTED (ELIGIBLE)
SOLVENT WIPES GENERATOR & HANDLING FACILITY

Item	Sub-sector	NAICS sub-sector code	1 Count of Affected LQGs + SQGs (facilities)	2 Direct & induced sub-sector annualized impact	3 (2 / 1) Avg ann'l impact per solvent wipes facility	4 Quantity of affected solvent wipes/year	5 (2 / 4) Ann. impact per solvent wipe	6 Average revenues per establishment (all estabs)	7 (1 x 6) Sub-total revenues of affected estabs	8 (2 / 7) Impact as % of affected facility annual revenue	9 Fixed cost component of annualized impact/facility	10 Variable component annualized impact/facilty
A. If Disposable Solvent Wipes Annualized Impact Allocated Across Sub-Sector Users:												
1	Printing	323	2,188	($8,602,806)	($3,932)	19,287,742	($0.4460)	$2,694,593	$5,895,972,072	-0.1459%	($131)	($3,801)
2	Chemical & Allied Products	325	171	($673,621)	($3,932)	9,445,028	($0.0713)	$11,155,436	$1,911,279,520	-0.0352%	($131)	($3,801)
3	Plastics & Rubber	326	222	($871,163)	($3,932)	11,340,323	($0.0768)	$7,668,885	$1,699,236,283	-0.0513%	($131)	($3,801)
4	Fabricated Metal Products	332	783	($3,079,351)	($3,932)	36,139,827	($0.0852)	$3,534,688	$2,768,422,319	-0.1112%	($131)	($3,801)
5	Industrial Machinery & Eqpt	333	380	($1,492,474)	($3,932)	21,417,408	($0.0697)	$1,735,384	$658,755,579	-0.2266%	($131)	($3,801)
6	Electronics & Computers	3344	84	($331,690)	($3,932)	12,663,188	($0.0262)	$5,654,297	$477,015,439	-0.0695%	($131)	($3,801)
7	Transportation Eqpt	336	175	($687,323)	($3,932)	9,277,098	($0.0741)	$22,606,244	$3,951,946,786	-0.0174%	($131)	($3,801)
8	Furniture & Fixtures	337	257	($1,011,990)	($3,932)	11,499,965	($0.0880)	$2,923,551	$752,504,040	-0.1345%	($131)	($3,801)
9	Auto Dealers (retail trade)	4411	639	($2,512,328)	($3,932)	29,235,926	($0.0859)	$5,715,674	$3,652,296,140	-0.0688%	($131)	($3,801)
10	Publishing (printed matter)	5111	1,242	($4,882,747)	($3,932)	9,975,680	($0.4895)	$5,878,513	$7,300,519,594	-0.0669%	($131)	($3,801)
11	Business services (copy shops)	561439	337	($1,325,220)	($3,932)	2,677,922	($0.4949)	$1,315,918	$443,546,201	-0.2988%	($131)	($3,801)
12	Auto Repair & Maintenance	8111	2,177	($8,560,080)	($3,932)	85,138,065	($0.1005)	$422,800	$920,523,910	-0.9299%	($131)	($3,801)
13	Military Bases	92812	7	($29,208)	($3,932)	621,409	($0.0470)	Not relevant	Not relevant	Not relevant	($131)	($3,801)
	Subtotals (or weighted average) =		8,663	($34,060,000)	($3,932)	258,719,583	($0.1316)	$3,515,901	$30,432,017,883	-0.1119%	($131)	($3,801)
						Min =	($0.4949)				3.3%	96.7%
						Max =	($0.0262)					
B. If Reusable Solvent Wipes Annualized Impact Allocated Across Sub-Sector Users:												
1	Printing	323	28,989	$2,914,749	$101	639,963,423	$0.0046	$2,694,593	$78,113,288,848	0.0037%	$3	$97
2	Chemical & Allied Products	325	1,735	$174,499	$101	65,904,321	$0.0026	$11,155,436	$19,360,244,604	0.0009%	$3	$97
3	Plastics & Rubber	326	2,216	$222,862	$101	76,635,961	$0.0029	$7,668,885	$16,998,036,538	0.0013%	$3	$97
4	Fabricated Metal Products	332	7,769	$781,138	$101	238,123,499	$0.0033	$3,534,688	$27,460,571,785	0.0028%	$3	$97
5	Industrial Machinery & Eqpt	333	3,742	$376,275	$101	138,105,840	$0.0027	$1,735,384	$6,494,288,848	0.0058%	$3	$97
6	Electronics & Computers	3344	872	$87,627	$101	91,897,779	$0.0010	$5,654,297	$4,927,749,907	0.0018%	$3	$97
7	Transportation Eqpt	336	1,780	$178,964	$101	65,418,787	$0.0027	$22,606,244	$40,236,829,371	0.0004%	$3	$97
8	Furniture & Fixtures	337	2,539	$255,267	$101	74,312,573	$0.0034	$2,923,551	$7,422,242,102	0.0034%	$3	$97
9	Auto Dealers (retail trade)	4411	6,362	$639,723	$101	194,873,507	$0.0033	$5,715,674	$36,365,566,787	0.0018%	$3	$97
10	Publishing (printed matter)	5111	16,453	$1,654,342	$101	330,610,306	$0.0050	$5,878,513	$96,721,556,477	0.0017%	$3	$97
11	Business services (copy shops)	561439	4,466	$449,003	$101	88,814,248	$0.0051	$1,315,918	$5,876,359,677	0.0076%	$3	$97
12	Auto Repair & Maintenance	8111	21,360	$2,147,636	$101	538,877,458	$0.0040	$422,800	$9,030,802,627	0.0238%	$3	$97
13	Military Bases	92812	79	$7,915	$101	4,666,663	$0.0017	Not relevant	Not relevant	Not relevant	$3	$97
	Subtotals (or weighted average) =		98,362	$9,890,000	$101	2,548,204,365	$0.0039	$3,551,041	$349,007,537,572	0.0028%	$3	$97
							Min =	$0.0010			$3	$97
							Max =	$0.0051			3.3%	96.7%
	Total (Disposables + Reusables) =		107,025			2,806,923,948						

C. Annualized Impact Allocated to Industrial Laundries in Form of Potential Reduced Profit:

Item	Sub-sector	NAICS Product Line Code	1997 Census Facilities	Annualized laundry impact (direct & induced)	Avg impact per affected laundry ($/yr)	Annual reusable wipes potentially affected (2001)	Annualized impact per reusable wipe	1997 Census avg revenues per laundry	1997 Census annual revenues all laundry items	Ann.impact as % of total annual laundry revenue	Annual revenue from wipes 2001 19%	Impact as % wipes laundry revenue
14	Linen Supply & Laundering (industrial)	812332	1,613					$1,835,510	$2,960,677,822			
	Laundries supplying industrial wipes =	8123326303	1,175			8,476,100,000		$1,835,510	$2,156,724,390		$412,900,000	
	Subset of laundries in states adopting rule =	75%	881			2,548,204,365		$1,835,510	$1,617,543,292		$309,675,000	
	Composite annualized impact (direct + induced) on laundry profits =			($3,800,000)	($4,312)		($0.0015)			-0.235%		-1.227%
	Fixed-magnitude component (i.e. same for each laundry) =				($474)	11%				-0.026%		-0.135%
	Variable-magnitude component (i.e. depends on annual wipes quantity laundered) =				($3,838)	89%				-0.209%		-1.092%

ESTABLISHMENT FIRM-SIZE BINS COMPARISON OF ANNUALIZED IMPACTS TO ANNUAL FIRM REVENUES POTENTIAL COST IMPACT ON REUSABLE WIPES USERS (spent solvent wipes generators):														
		NAICS	NAICS code used	Small Firm Size Bins (1997 Economic Census)							Reusable wipes small	Reusable wipes Non-small	Reusable wipes
Item	Sub-sector	subsector code	to represent subsector*	Bin#1	Bin#2	Bin#3	Bin#4	Bin#5	Bin#6	Bin#7	firm SQG+LQG establishmts	SQG+LQG estabmts	SQG+LQG establishmts
1	Printing	323*	323110	37.3%	23.8%	17.0%	12.6%	5.0%	3.2%	0.8%	99.7%	0.3%	100%
a	Nr. of reusable wipes establishments			10,807	6,906	4,922	3,643	1,457	918	246	28,899	90	28,989
b	Estab average annual revenues (1997)			$166,773	$540,361	$1,211,816	$3,219,174	$8,292,818	$21,696,276	$48,942,823			$2,694,593
c	Estimated annualized impact to estab			$9	$23	$47	$119	$302	$786	$1,769			$101
d	Impact as % of estabmnt revenue			0.0056%	0.0042%	0.0039%	0.0037%	0.0036%	0.0036%	0.0036%			0.0037%
2	**Chemical & Allied Products**	325*	325998	26.5%	15.3%	21.2%	21.1%	9.2%	5.0%	1.3%	99.7%	0.3%	100%
a	Nr. of reusable wipes establishments			461	266	369	366	160	86	23	1,729	6	1,735
b	Estab average annual revenues (1997)			$811,613	$2,067,119	$5,067,393	$10,157,731	$24,525,830	$46,423,351	$156,459,467			$11,155,436
c	Estimated annualized impact to estab			$10	$21	$48	$92	$217	$408	$1,367			$101
d	Impact as % of estabmnt revenue			0.0013%	0.0010%	0.0009%	0.0009%	0.0009%	0.0009%	0.0009%			0.0009%
3	**Plastics & Rubber**	326*	326199	18.0%	11.4%	16.1%	23.0%	14.0%	12.7%	3.8%	99.0%	1.0%	100%
a	Nr. of reusable wipes establishments			399	253	356	511	310	281	85	2,195	22	2,216
b	Estab average annual revenues (1997)			$232,163	$749,746	$1,548,088	$3,670,055	$8,121,002	$19,183,242	$45,312,970			$7,668,885
c	Estimated annualized impact to estab			$6	$13	$23	$50	$106	$246	$578			$101
d	Impact as % of estabmnt revenue			0.0027%	0.0017%	0.0015%	0.0014%	0.0013%	0.0013%	0.0013%			0.0013%
4	**Fabricated Metal Products**	332*	332322	21.0%	16.8%	23.1%	24.1%	9.4%	4.7%	0.7%	99.9%	0.1%	100%
a	Nr. of reusable wipes establishments			1,632	1,307	1,794	1,872	731	367	57	7,760	9	7,769
b	Estab average annual revenues (1997)			$236,301	$727,509	$1,725,943	$3,878,829	$7,908,748	$18,766,057	$41,763,485			$3,534,688
c	Estimated annualized impact to estab			$10	$23	$51	$110	$221	$519	$1,152			$101
d	Impact as % of estabmnt revenue			0.0042%	0.0032%	0.0029%	0.0028%	0.0028%	0.0028%	0.0028%			0.0028%
5	**Industrial Machinery & Eqpt**	333*	333514	34.7%	22.5%	20.3%	16.0%	4.2%	1.9%	0.2%	99.9%	0.1%	100%
a	Nr. of reusable wipes establishments			1,299	842	761	598	159	73	8	3,739	3	3,742
b	Estab average annual revenues (1997)			$159,044	$529,145	$1,234,547	$3,133,995	$7,603,592	$17,079,837	$35,781,500			$1,735,384
c	Estimated annualized impact to estab			$12	$33	$72	$179	$429	$960	$2,007			$101
d	Impact as % of estabmnt revenue			0.0077%	0.0062%	0.0059%	0.0057%	0.0056%	0.0056%	0.0056%			0.0058%
6	**Electronics & Computers**	3344*	334419	30.8%	15.4%	15.2%	15.9%	9.8%	8.6%	3.3%	98.9%	1.1%	100%
a	Nr. of reusable wipes establishments			268	134	133	138	85	75	28	862	10	872
b	Estab average annual revenues (1997)			$182,117	$715,720	$1,356,921	$3,467,357	$7,769,417	$16,990,567	$43,934,817			$5,654,297
c	Estimated annualized impact to estab			$6	$16	$27	$63	$137	$295	$759			$101
d	Impact as % of estabmnt revenue			0.0036%	0.0022%	0.0020%	0.0018%	0.0018%	0.0017%	0.0017%			0.0018%
7	**Transportation Eqpt**	336*	336399	22.9%	11.9%	12.9%	17.2%	10.6%	11.1%	8.2%	95.0%	5.0%	100%
a	Nr. of reusable wipes establishments			407	213	230	306	189	198	146	1,690	90	1,780
b	Estab average annual revenues (1997)			$271,638	$906,161	$2,184,036	$4,575,185	$9,801,975	$27,305,030	$60,861,476			$22,606,244
c	Estimated annualized impact to estab			$5	$7	$13	$23	$45	$121	$265			$101
d	Impact as % of estabmnt revenue			0.0017%	0.0008%	0.0006%	0.0005%	0.0005%	0.0004%	0.0004%			0.0004%
8	**Furniture & Fixtures**	337*	337122	52.1%	16.6%	12.0%	8.3%	4.3%	3.4%	2.1%	98.8%	1.2%	100%
a	Nr. of reusable wipes establishments			1,324	421	303	212	109	85	53	2,507	32	2,539
b	Estab average annual revenues (1997)			$114,767	$434,557	$935,315	$2,258,826	$5,780,285	$13,961,163	$33,148,300			$2,923,551
c	Estimated annualized impact to estab			$7	$18	$34	$78	$196	$468	$1,105			$101
d	Impact as % of estabmnt revenue			0.0062%	0.0041%	0.0037%	0.0035%	0.0034%	0.0033%	0.0033%			0.0034%
9	**Auto Dealers (retail trade)**	4411	4411	11.4%	12.3%	14.2%	14.9%	7.9%	6.9%	9.2%	76.8%	23.2%	100%
a	Nr. of reusable wipes establishments			724	781	902	946	505	439	587	4,884	1,479	6,362
	Firm avg revenues (1997)			$147,805	$364,309	$714,842	$1,562,899	$3,516,204	$7,205,978	$16,391,207			$7,553,575
b	Estab average annual revenues (1997)			$147,546	$362,377	$699,884	$1,430,123	$2,820,889	$5,376,398	$12,592,814			$5,715,674
c	Estimated annualized impact to estab			$6	$10	$15	$28	$51	$95	$217			$101
d	Impact as % of estabmnt revenue			0.0040%	0.0026%	0.0021%	0.0018%	0.0015%	0.0013%	0.0013%			0.0013%
10	**Publishing (printed matter)**	5111	5111	36.0%	15.1%	12.4%	11.1%	5.6%	5.7%	4.8%	90.8%	9.2%	100%
a	Nr. of reusable wipes establishments			5,924	2,478	2,037	1,831	927	945	789	14,932	1,522	16,453
	Firm avg revenues (1997)			$294,086	$811,844	$1,804,575	$3,923,123	$9,714,883	$28,334,463	$83,761,571			$7,451,525
b	Estab average annual revenues (1997)			$292,748	$794,184	$1,707,675	$3,209,894	$6,078,029	$12,218,049	$15,305,829			$5,878,513
c	Estimated annualized impact to estab			$8	$16	$32	$56	$104	$205	$256			$101
d	Impact as % of estabmnt revenue			0.0028%	0.0020%	0.0018%	0.0014%	0.0011%	0.0007%	0.0003%			0.0013%
11	**Business services (copy shops)**	561439	561439	8.1%	17.6%	17.1%	12.6%	9.0%	4.7%	Not relevant	69.2%	30.8%	100%
a	Nr. of reusable wipes establishments			363	787	763	562	404	212		3,090	1,375	4,466
	Firm avg revenues (1997)			$62,017	$173,524	$353,733	$705,248	$1,492,477	$3,397,878				$1,956,416
b	Estab average annual revenues (1997)			$62,017	$173,524	$350,485	$682,179	$1,311,178	$2,064,000				$1,315,918
c	Estimated annualized impact to estab			$8	$16	$29	$54	$100	$156				$101
d	Impact as % of estabmnt revenue			0.0128%	0.0093%	0.0083%	0.0076%	0.0067%	0.0046%				0.0051%
12	**Auto Repair & Maintenance**	8111	8111	12.3%	31.1%	26.3%	14.9%	7.2%	2.0%	Not relevant	93.8%	6.2%	100%
a	Nr. of reusable wipes establishments			2,633	6,648	5,608	3,174	1,541	430		20,034	1,325	21,360

Item	Sub-sector	NAICS subsector code	NAICS code used to represent subsector*	Small Firm Size Bins (1997 Economic Census)							Reusable wipes small firm SQG+LQG establishmts	Reusable wipes Non-small SQG+LQG estabmts	Reusable wipes SQG+LQG establishmts
				Bin#1	Bin#2	Bin#3	Bin#4	Bin#5	Bin#6	Bin#7			
	Firm avg revenues (1997)			$64,908	$170,162	$351,875	$679,335	$1,447,114	$3,326,605				$464,358
b	Estab average annual revenues (1997)			$64,852	$169,836	$348,987	$654,999	$1,201,655	$1,587,994				$422,800
c	Estimated annualized impact to estab			$18	$42	$84	$154	$280	$368				$101
d	Impact as % of estabmnt revenue			0.0281%	0.0249%	0.0238%	0.0227%	0.0193%	0.0111%				0.0217%
13	**Military Bases**	92812	92812	Not relevant	Not relevant	Not relevant	Not relevant	Not relevant	Not relevant	Not relevant			100%
a	Nr. of reusable wipes establishments												79
b	Estab average annual revenues (1997)												Not relevant
c	Estimated annualized impact to estab												$101
d	Impact as % of estabmnt revenue												Not relevant
								Optional exponential factor for scaling costs to firm sizes =	1.000	Column totals =	92,321	5,962	98,362
											93.9%	6.1%	100%
	Count of facilities >1% revenue =			0	0	0	0	0	0	0	0		
	Count of facilities >3% revenue =			0	0	0	0	0	0	0	0		

* Indicates that in absence of 1997 Economic Census firm size data for the 3-digit NAICS code manufacturing sub-sectors, the respective largest number of establishments 6-digit NAICS code industry used to represent the size-bin percentage distribution for each sub-sector. The 6-digit industry code shown represents the single largest industry by number of establishments within the sub-sector, ranging from 7.2% to 51.0% subsector coverages. Items 9-14 firm size bin distributions based on exact data (1997 Economic Census) matching the NAICS code displayed for these sub-sectors.

POTENTIAL IMPACT ON INDUSTRIAL LAUNDRIES
(Suppliers of Reusable Wipes)
BY SMALL BUSINESS SIZE CATEGORIES

		Small Business Size Bins										
Small firm size bins>		Small-1	Small-2	Small-3	Small-4	Small-5	Small-6	Small-7	All Small	Non-small	All sizes	%
Linen Supply & Laundering		4.6%	8.7%	7.5%	5.8%	8.1%	6.9%	5.2%	46.9%	53.1%	100%	
Total number of wipes laundries (1997)		54	102	89	68	95	81	61	551	624	1,175	100.0%
Nr. of affected wipes laundries (1997)		41	77	66	51	72	61	46	413	468	881	75.0%
Firm average annual revenues (1997)		$63,451	$167,470	$367,652	$710,414	$1,614,808	$3,583,571	$6,705,089	$1,522,847	$84,313,936	$6,291,001	
Estab average annual revenues (1997)		$63,451	$167,470	$364,483	$694,449	$1,550,216	$3,076,462	$4,693,563	$1,423,577	$4,850,373	$3,104,549	
Imputed median annual revenues (2001)>		$37,514	$99,014	$215,494	$410,581	$916,538	$1,818,905	$2,774,987	$841,665	$2,867,698	$1,835,510	58.4%
A. Estimated Number Establishments by Small Parent Firm Size Bin:												Sample
Wipes as % of lbs laundered	10%	27	50	44	33	47	40	30	271	307	578	65.5%
	20%	8	16	14	11	15	13	9	85	97	182	20.7%
	30%	1	3	2	2	2	2	2	14	16	30	3.4%
	40%	1	3	2	2	2	2	2	14	16	30	3.4%
	50%	1	2	1	1	2	1	1	9	10	19	2.1%
	60%	0	0	0	0	0	0	0	0	0	0	0.0%
	70%	1	1	1	1	1	1	1	6	6	12	1.4%
	80%	1	1	1	1	1	1	1	6	6	12	1.4%
	90%	0	1	0	0	0	0	0	3	3	6	0.7%
	100%	1	1	1	1	1	1	1	6	6	12	1.4%
Column subtotals (subject to integer rounding) =		41	78	66	52	71	61	47	414	467	881	100.0%
B. Estimated Annualized Impact to Industrial Laundry Small Firms ($ per firm):												
Wipes as % of lbs laundered	10%	($46)	($121)	($264)	($504)	($1,125)	($2,232)	($3,405)			($2,479)	
	20%	($92)	($243)	($529)	($1,008)	($2,249)	($4,464)	($6,810)			($4,484)	
	30%	($138)	($364)	($793)	($1,511)	($3,374)	($6,696)	($10,215)			($6,488)	
	40%	($184)	($486)	($1,058)	($2,015)	($4,499)	($8,928)	($13,621)			($8,493)	
	50%	($230)	($607)	($1,322)	($2,519)	($5,623)	($11,160)	($17,026)			($10,498)	
	60%	($276)	($729)	($1,587)	($3,023)	($6,748)	($13,392)	($20,431)			($12,503)	
	70%	($322)	($850)	($1,851)	($3,527)	($7,873)	($15,624)	($23,836)			($14,507)	
	80%	($368)	($972)	($2,115)	($4,031)	($8,997)	($17,856)	($27,241)			($16,512)	
	90%	($414)	($1,093)	($2,380)	($4,534)	($10,122)	($20,088)	($30,646)			($18,517)	
	100%	($460)	($1,215)	($2,644)	($5,038)	($11,247)	($22,320)	($34,052)			($20,522)	
C. Annualized Impact as Percentage of Small Firm Annual Revenue:												
Wipes as % of lbs laundered	10%	-0.07%	-0.07%	-0.07%	-0.07%	-0.07%	-0.06%	-0.05%			-0.039%	
	20%	-0.15%	-0.15%	-0.14%	-0.14%	-0.14%	-0.12%	-0.10%			-0.071%	
	30%	-0.22%	-0.22%	-0.22%	-0.21%	-0.21%	-0.19%	-0.15%			-0.103%	
	40%	-0.29%	-0.29%	-0.29%	-0.28%	-0.28%	-0.25%	-0.20%			-0.135%	
	50%	-0.36%	-0.36%	-0.36%	-0.35%	-0.35%	-0.31%	-0.25%			-0.167%	
	60%	-0.44%	-0.44%	-0.43%	-0.43%	-0.42%	-0.37%	-0.30%			-0.199%	
	70%	-0.51%	-0.51%	-0.50%	-0.50%	-0.49%	-0.44%	-0.36%			-0.231%	
	80%	-0.58%	-0.58%	-0.58%	-0.57%	-0.56%	-0.50%	-0.41%			-0.262%	
	90%	-0.65%	-0.65%	-0.65%	-0.64%	-0.63%	-0.56%	-0.46%			-0.294%	
	100%	-0.73%	-0.73%	-0.72%	-0.71%	-0.70%	-0.62%	-0.51%			-0.326%	

Small firm size bins>		Small Business Size Bins										
		Small-1	Small-2	Small-3	Small-4	Small-5	Small-6	Small-7	All Small	Non-small	All sizes	%
D. Number of Small Business Establishments Impacted >1% Annual Firm Revenues:												
Wipes as % of lbs laundered	10%	0	0	0	0	0	0	0	0			
	20%	0	0	0	0	0	0	0	0			
	30%	0	0	0	0	0	0	0	0			
	40%	0	0	0	0	0	0	0	0			
	50%	0	0	0	0	0	0	0	0			
	60%	0	0	0	0	0	0	0	0			
	70%	0	0	0	0	0	0	0	0			
	80%	0	0	0	0	0	0	0	0			
	90%	0	0	0	0	0	0	0	0			
	100%	0	0	0	0	0	0	0	0			
Column totals =		0	0	0	0	0	0	0	0			
Percent of small industrial laundries impacted >1% of annual revenues =									0.0%		414	
Percent of all affected small wipes users + small laundries =									0.000%		92,735	
E. Number of Small Business Establishments Impacted >3% Annual Firm Revenues:												
	10%	0	0	0	0	0	0	0	0			
	20%	0	0	0	0	0	0	0	0			
	30%	0	0	0	0	0	0	0	0			
	40%	0	0	0	0	0	0	0	0			
	50%	0	0	0	0	0	0	0	0			
	60%	0	0	0	0	0	0	0	0			
	70%	0	0	0	0	0	0	0	0			
	80%	0	0	0	0	0	0	0	0			
	90%	0	0	0	0	0	0	0	0			
	100%	0	0	0	0	0	0	0	0			
Column totals =		0	0	0	0	0	0	0	0			
Percent of small industrial laundries impacted >3% of annual revenues =									0.0%		414	
Percent of all affected small generators + small laundries =									0.000%		92,735	